H E
4491
S4
K35
1975
ENVI

CAP Set No. 2 of 4.

One Set Of Original Graphics
For Use in Conjunction with Working Copies of the Report

Golden Gate Long Range Transportation Program

Phase II–Element A

San Francisco Transit Route Studies

submitted to

Golden Gate Corridor Board of Control

REPORT 75 - 7 - RE

FEBRUARY 1975

prepared by
KAISER ENGINEERS
in association with
WALLACE McHARG ROBERTS and TODD
JHK and ASSOCIATES

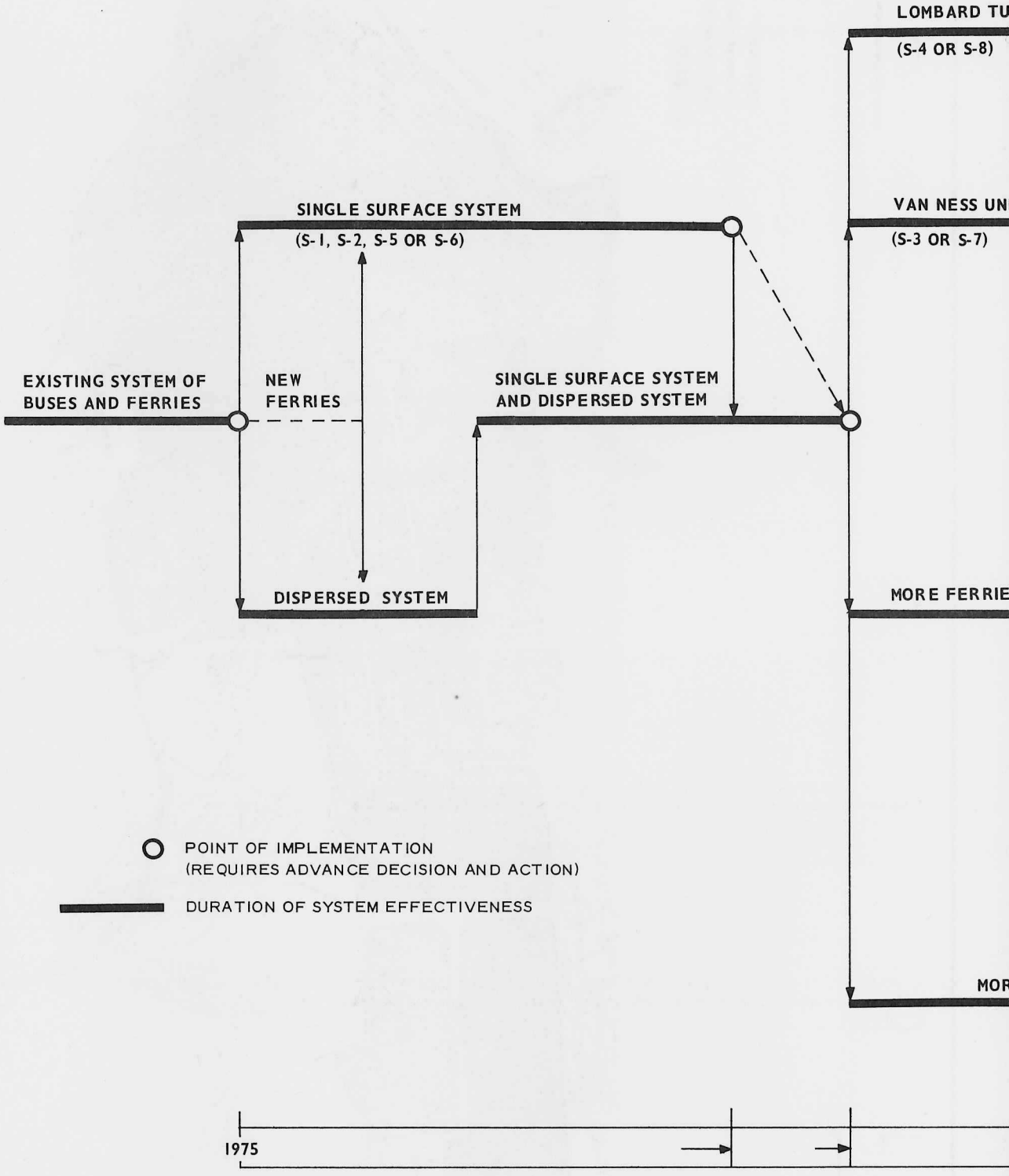
The preparation of this report has been financed in part through a grant from the U.S. Department of Transportation, Urban Mass Transportation Administration, under the Urban Mass Transportation Act of 1964, as amended.

Rec'd UCB ENV
JUL 22 1988

HE4491
S4
K35
1975
ENVI

This report was delivered March 1, 1975, subject to the Citizens Advisory Panel's proposed changes, modifications, additions, or comments to be submitted within two weeks from this date.

SAN FRANCISCO PORT



TION - GOLDEN GATE TRANSIT SYSTEM

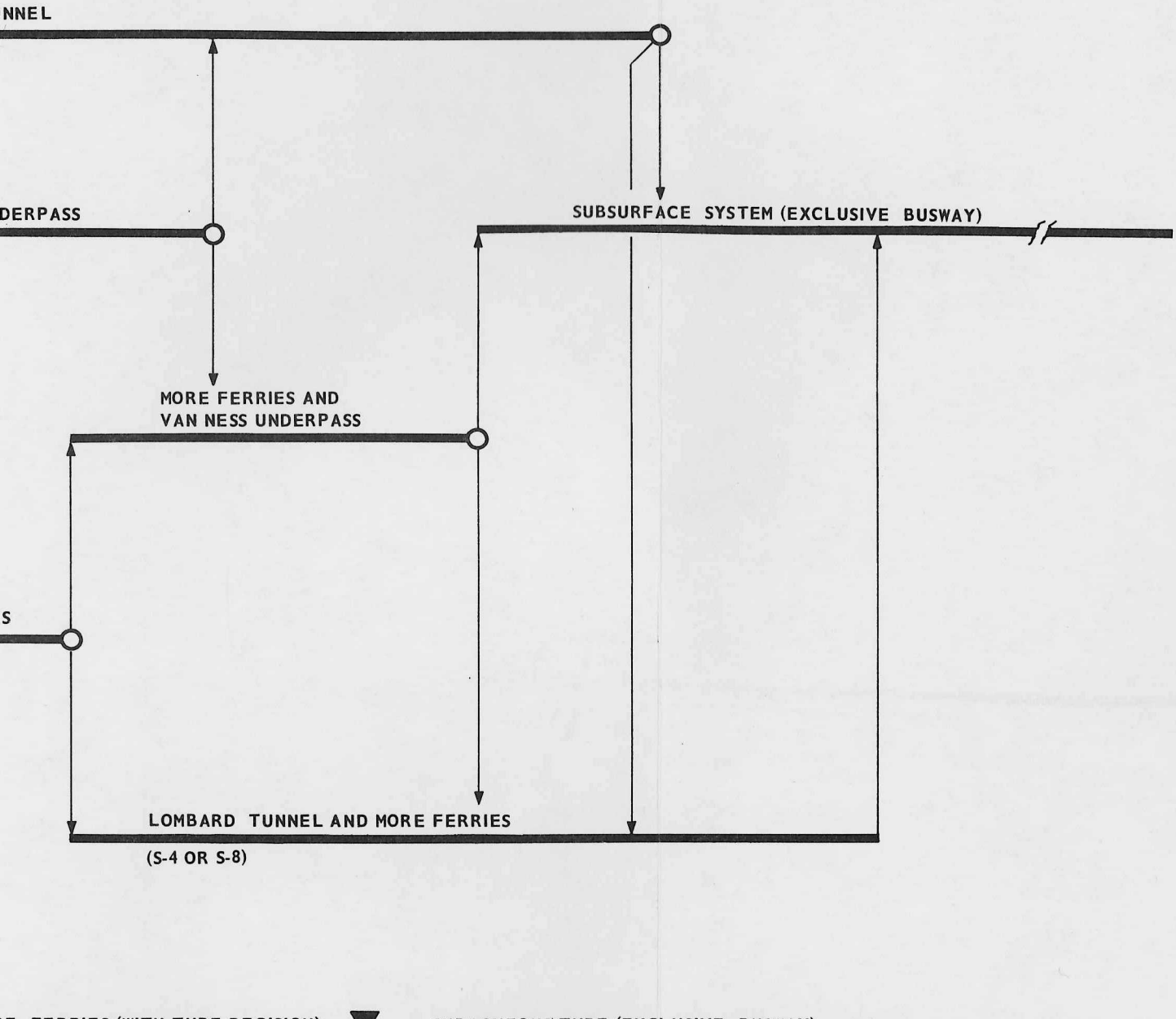
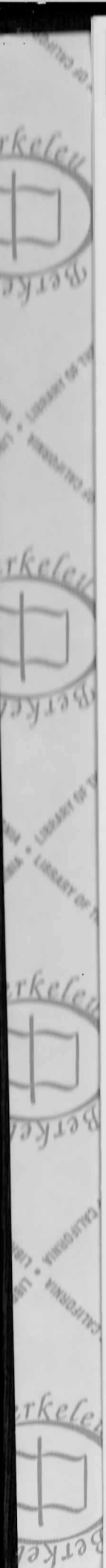
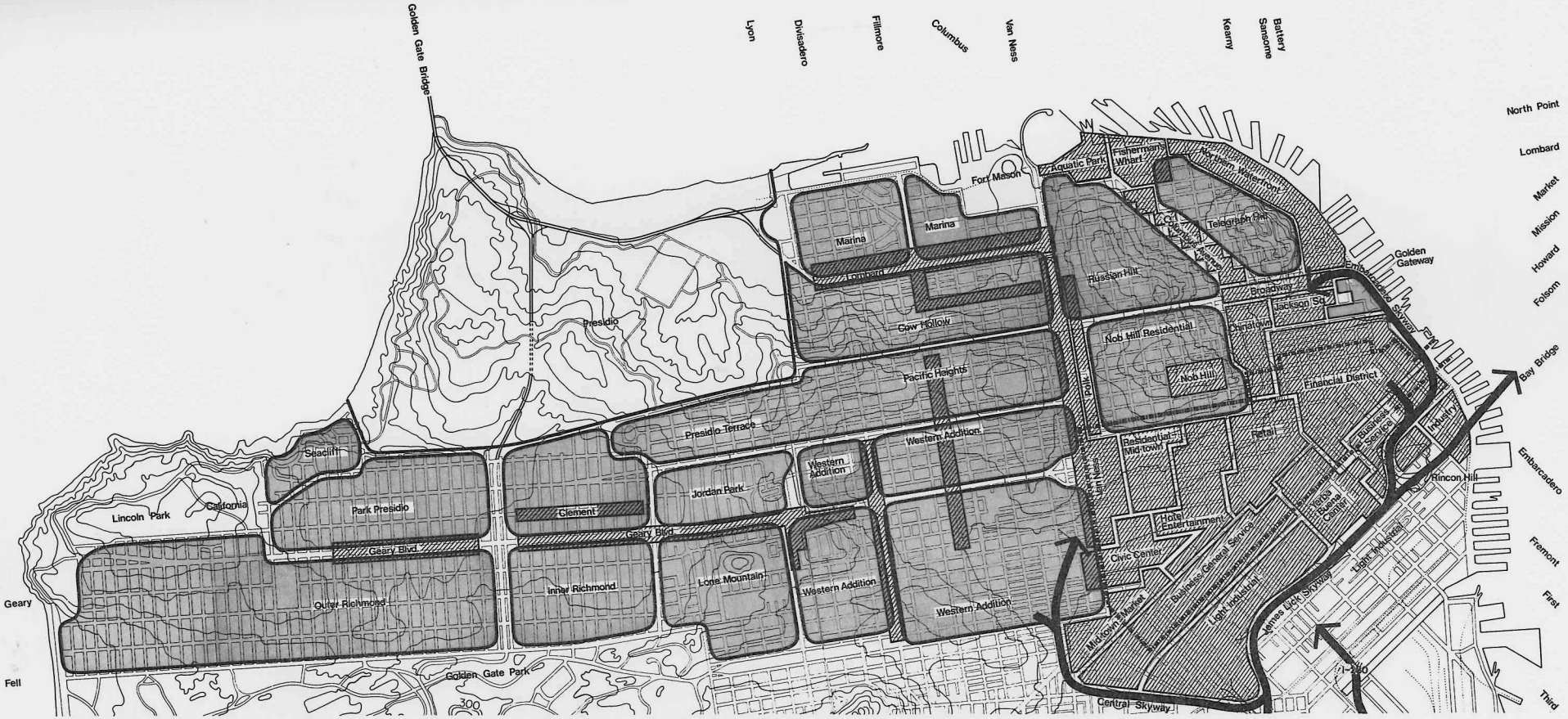


FIGURE II - 1

DECISION DIAGRAM

KAISER ENGINEERS





Functional Zones

legend:

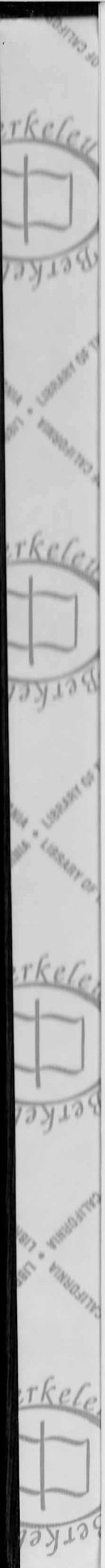
- Residential district
- Commercial district
- CBD boundary

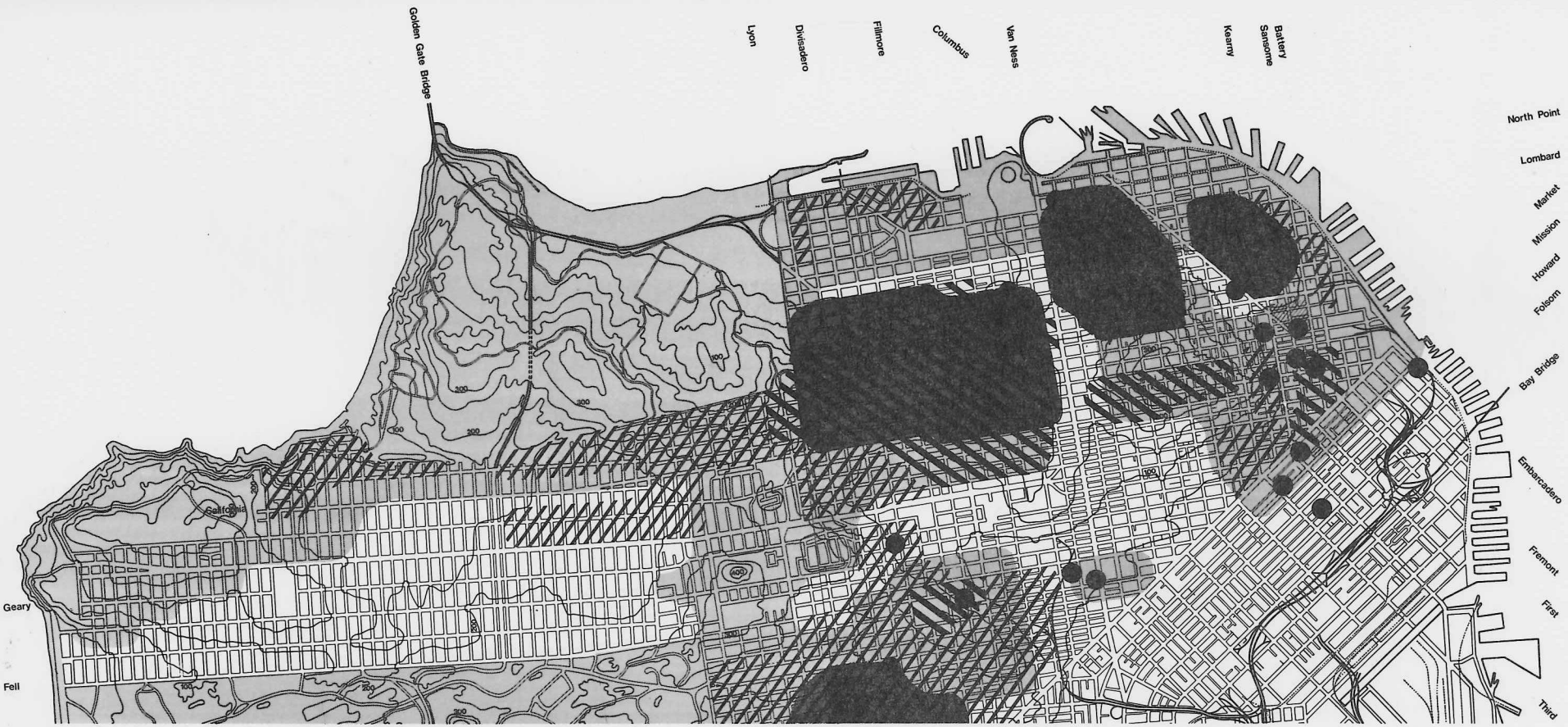
MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: City Planning Department

Figure III-1





Visual Resources

legend:

Historic structures:
- high concentration
- low concentration

Historic district

Composition of area:
- outstanding, unique
- generally pleasing
- diverse and average

Historic landmark

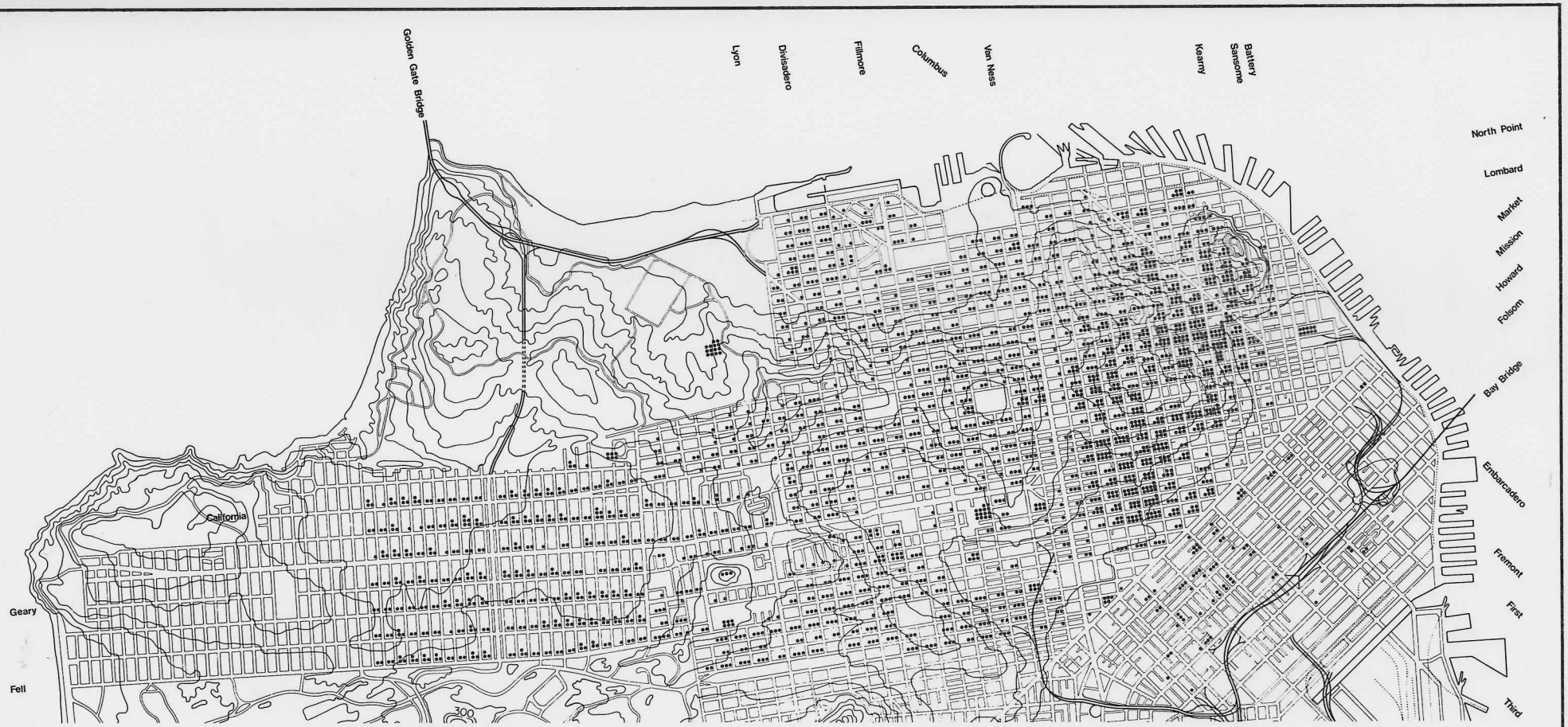
MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: Urban Design Plan 1971; San Francisco Urban Design Study, Preliminary Report No.1, March '69
City Planning Department

PREPARED IN COOPERATION WITH THE NORTHWEST SAN FRANCISCO RAPID TRANSIT EXTENSION STUDY AND DANIEL, MANN, JOHNSON & MENDENHALL.

Figure III-2



1970 Residential Population Density

legend:

Each dot is 100 persons •

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: 1970 Census

Figure III-3

1975–1990 Employment Density

legend:

Employment Density thru 1975

500 employees

1–499 "

Employment Added 1975–1990

500 employees

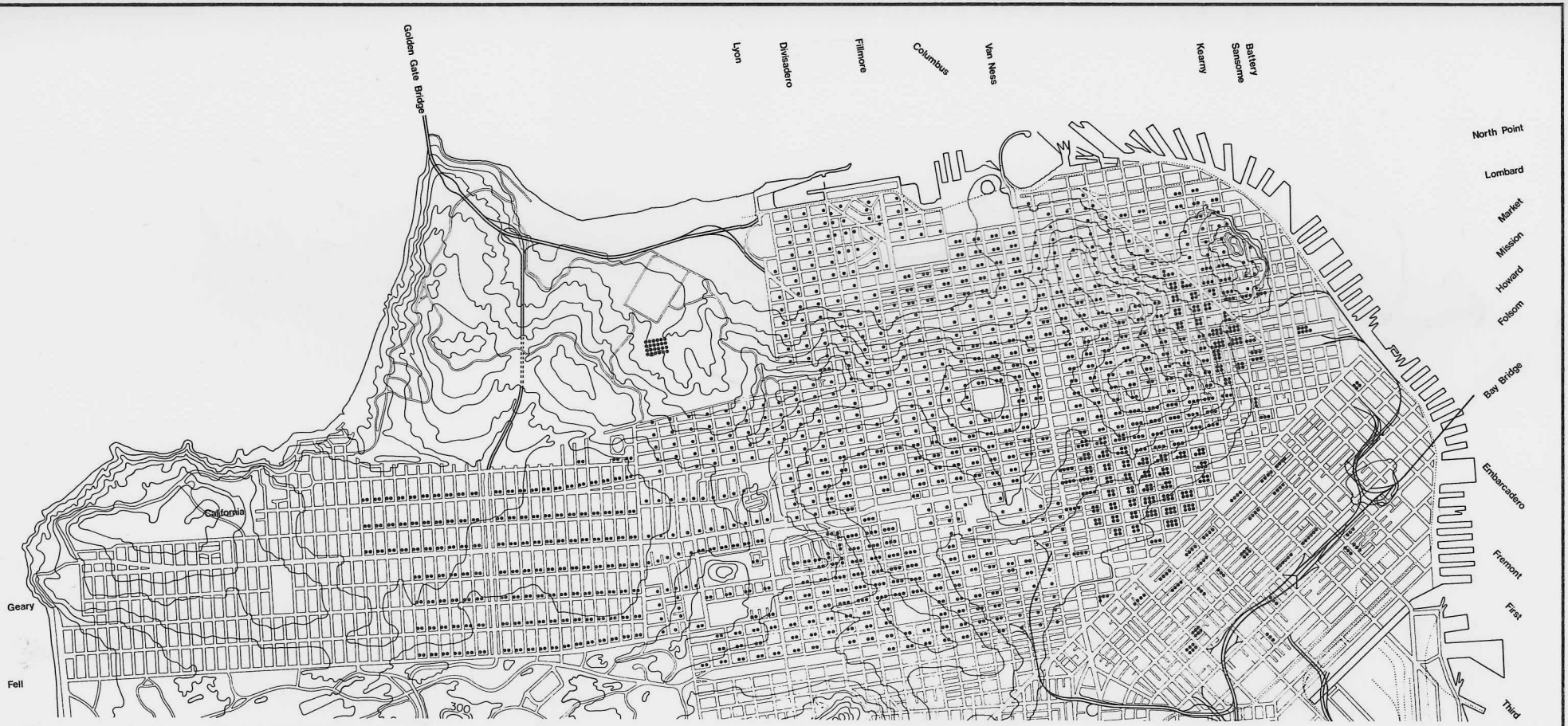
1–499 "

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: Employment location and density from MTC data. Updated to 1975 from City Planning data.

Figure III-4



Transit Dependent Population

legend:

50 persons •

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: 1970 Census

Figure III-5

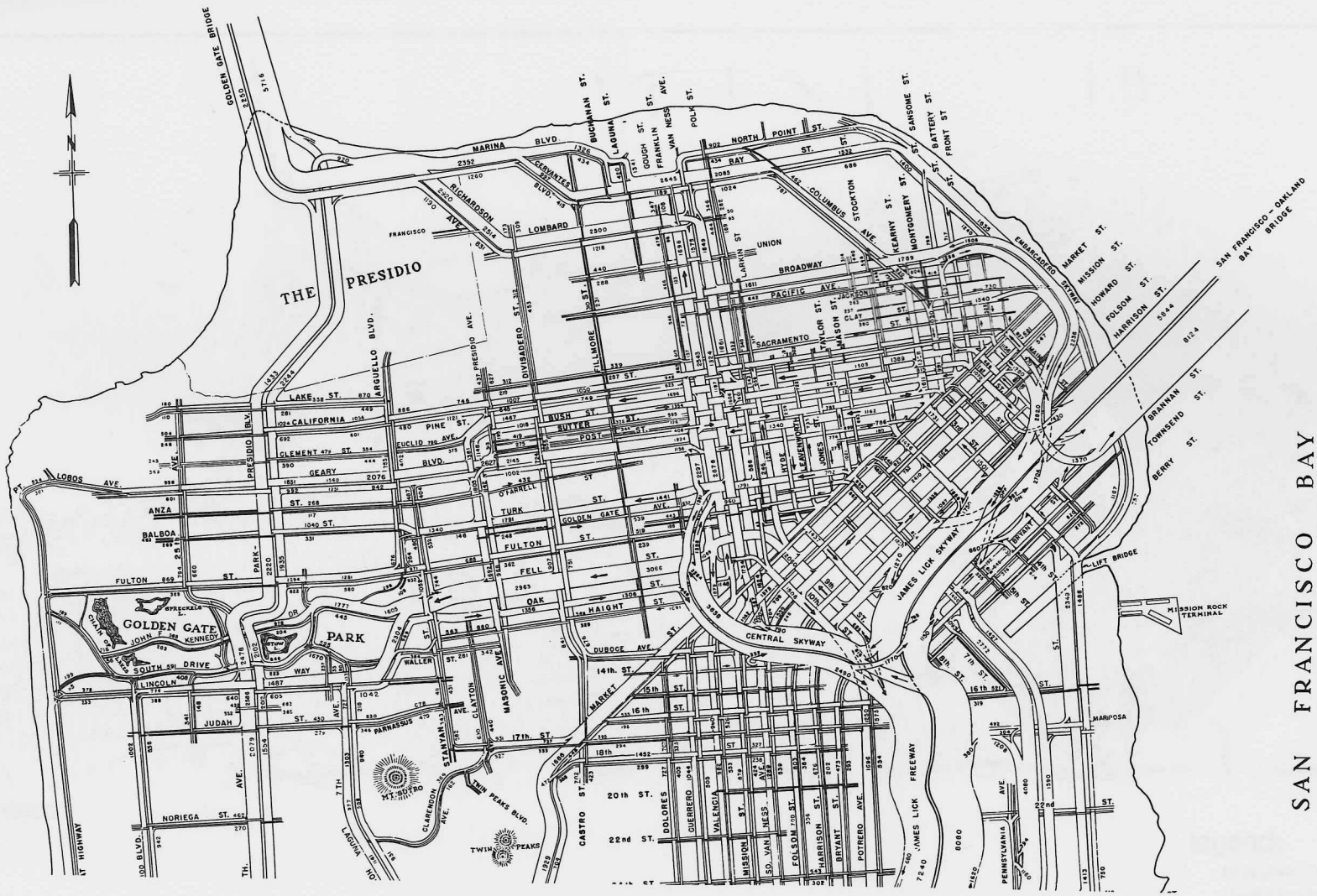
Transportation Network

legend:

- Golden Gate
- AC Transit
- Top ten MUNI lines
- Crosstown MUNI lines
- BART
- BART stations
- MUNI metro
- Southern Pacific
- Transportation terminals

Source: S.F. Municipal Railway - Annual Report 1970-1971

Figure III-6A



NOTES

1. FIGURES SHOWN ARE ACTUAL TRAFFIC COUNTS TAKEN IN THE EVENING PEAK HOUR AT VARIOUS TIMES IN THE YEARS 1969 THRU 1973, UNADJUSTED AS TO AVERAGE DAILY TRAFFIC.
2. LOCATION OF STREETS AND FREEWAY RAMPS ARE DIAGRAMMATIC ONLY.
3. MAJOR ONE-WAY TRAFFIC FLOWS ARE SHOWN BY DIRECTION ARROW.
4. WIDTH OF FLOW NOT TO SCALE

CITY & COUNTY OF SAN FRANCISCO

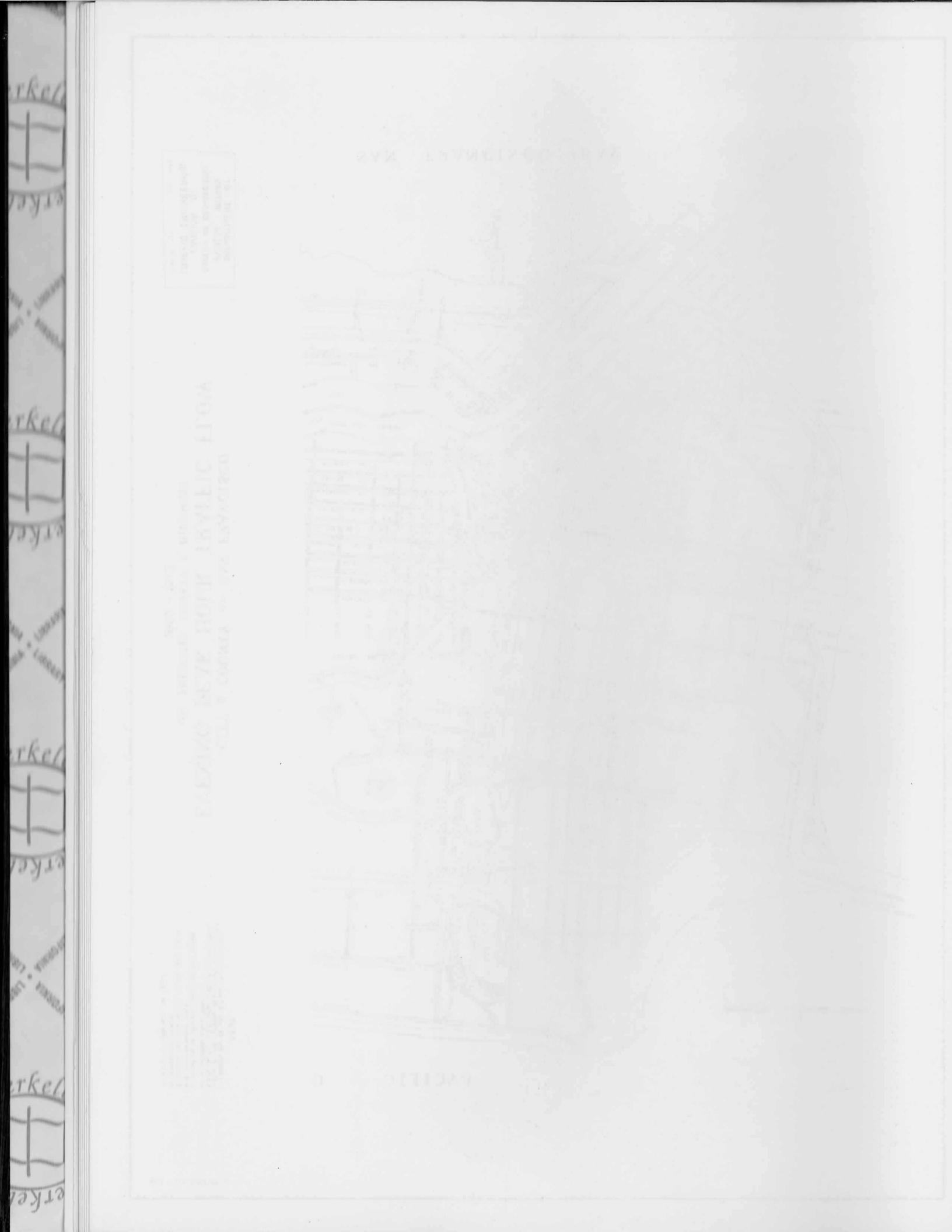
EVENING PEAK HOUR TRAFFIC FLOW

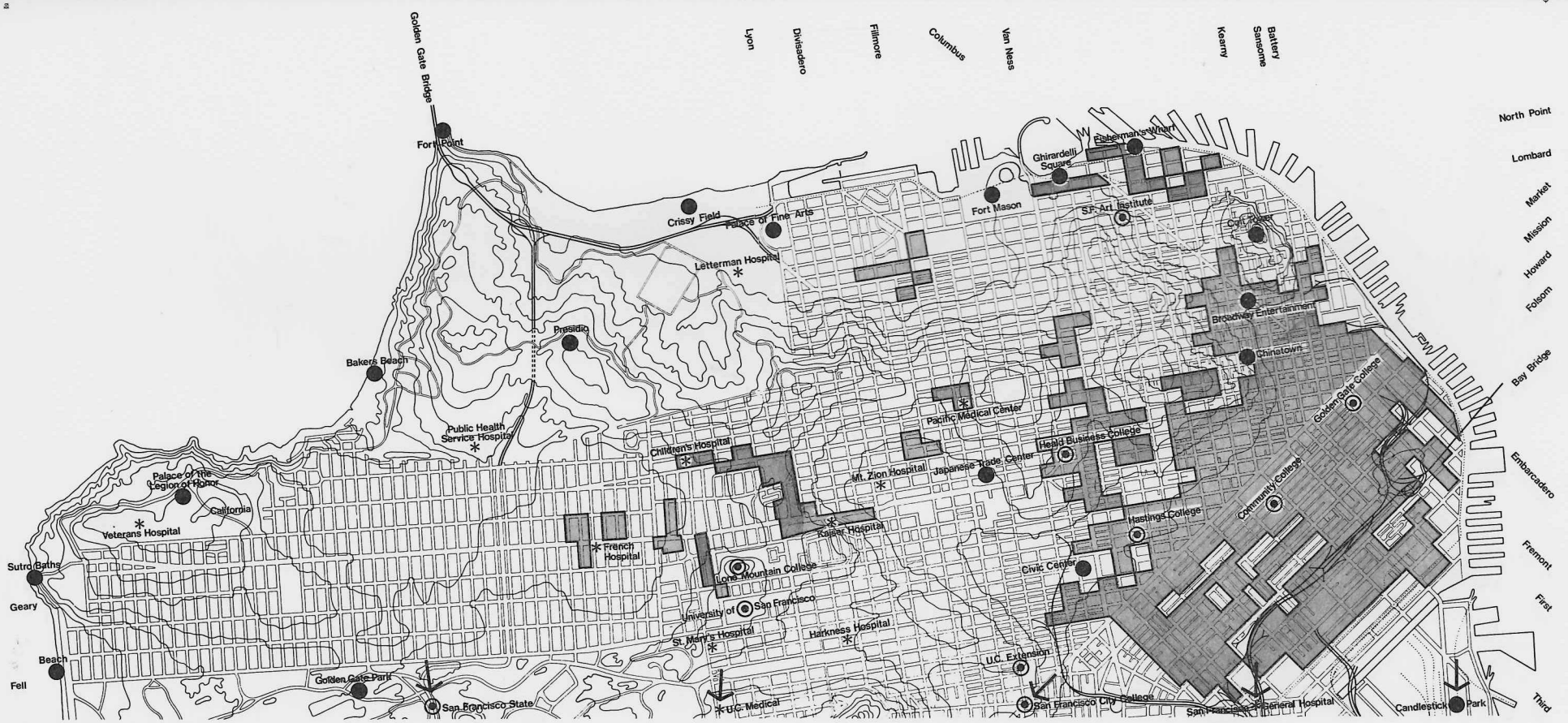
ON PRINCIPAL STREETS & HIGHWAYS

1969 - 1973

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF TRAFFIC ENGINEERING
DRAWN BY Y.T.F. JULY - 1973

FIGURE III - 6B





Activity Centers

legend:

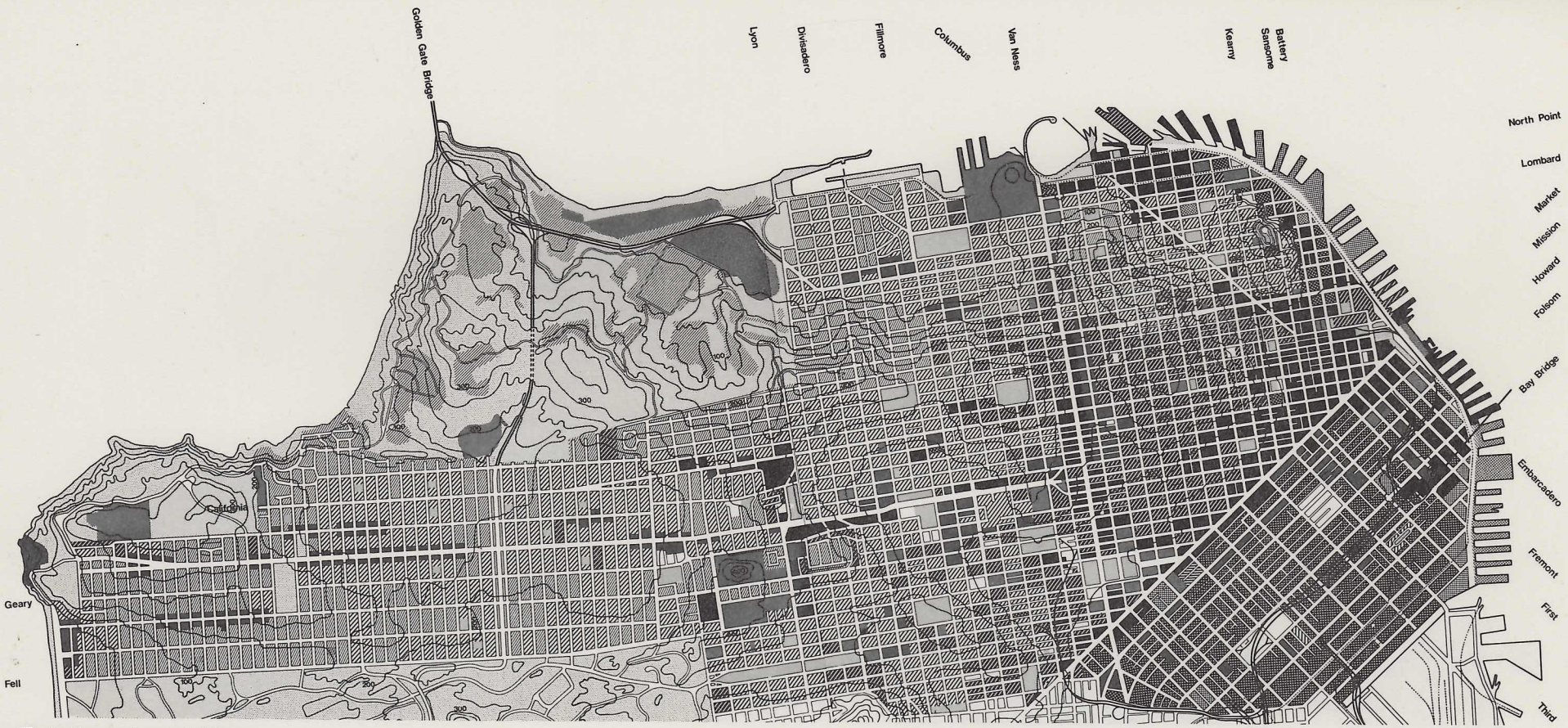
- Employment centers
- Hospital/health care
- Colleges
- Regional recreation

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: City Planning Data

Figure III-7



Existing Land Use

legend:

- Residential
  - 1-4 d.u./acre
  - 5-20 d.u./acre
  - +20 d.u./acre
- Park/playground
- Open space
- Commercial
- Regional commercial (CBD)
- Light industrial
- Heavy industrial
- Institutional

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: Community Area Land Use Study 1970, City Planning Department

PREPARED IN COOPERATION WITH THE NORTHWEST SAN FRANCISCO RAPID TRANSIT EXTENSION STUDY AND DANIEL, MANN, JOHNSON & MENDENHALL.

Figure III-8

Current Zoning Plan

legend:

Industrial Districts:
- M-1
- M-2

Public Districts:
- P
- Playground · Park

Commercial Districts:
- C-1, C-2
- C-M, C-3-R, C-3-G, C-3-S
- C-3-O

Dwelling Districts:
- R-1, R-1-D, R-2
- R-3, R-3.5
- R-4, R-5

Source: City Planning Code 1972

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Figure III-9A

Height and Bulk Districts

legend:

Height in feet

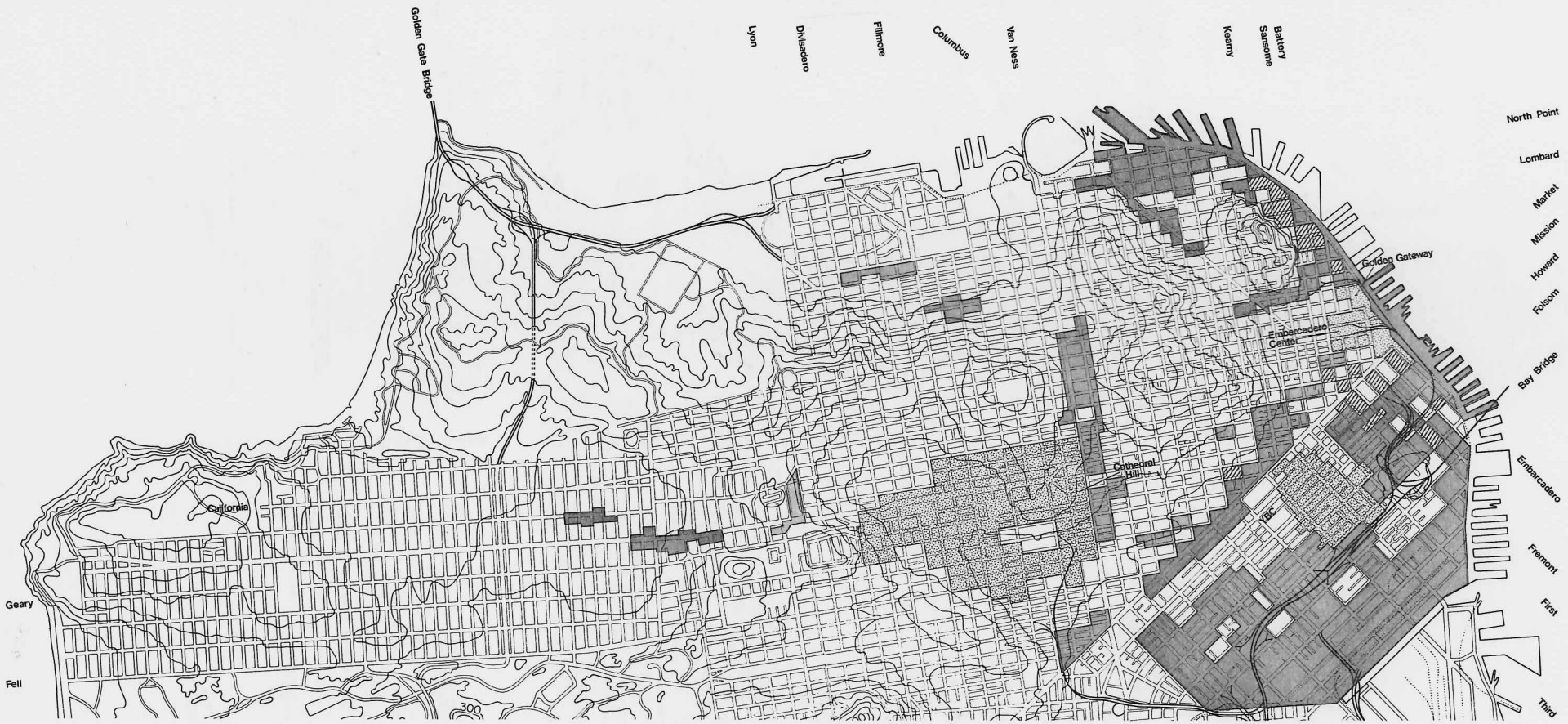
- open
- 0-40
- 41-88
- 89-160
- 161-240
- 241-399
- 400-699
- 700+

Source: City Planning Code 1972

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Figure III-9B



Development Potential

legend:

- Areas of opportunity
- Committed/planned projects
- Redevelopment areas

MINUTES WALKING
0 5 10 15 20

SCALE IN FEET
0 400 800 1600 3200 6400

Source: City Planning Data, Assessors Block Data, Redevelopment Agency, Wells Fargo Bank, Coldwell-Banker, SPUR High-rise Study, 1970 Census, 1965 Zoning Study, WMRT Field Inspection.

Figure III-10

EXPLANATION

Holocene — Recent	Qaf — Artificial fill: Predominantly dune sand but includes silt, clay, rock waste, man-made debris, and organic waste.	Ql — Landslide deposits: Generally unstratified mixtures of rock, sand, silt, and clay in varying proportions.	Qrb — Beach deposits: Predominantly well-sorted medium- to coarse-grained grey sand; may be coarse gravel and large cobbles.	Qd — Dune sand: Clean, well-sorted, fine- to medium-grained sand; light grey except for local concentrations of black sand in ripple troughs.	Qu — Quaternary deposits, undifferentiated: Includes Colma formation of unconsolidated sand and clay, alluvium, slope debris, and bay mud; less commonly includes dune sand, beach deposits, landslides, and fill.
Pleistocene					
					QUATERNARY
Franciscan Group	KJu — Undifferentiated Franciscan group rocks, including serpentine, greywacke (sandstone), chert, greenstone, shale, gabbro, diabase and minor quantities of metamorphic rocks. The rocks may be more or less weathered and vary from thinly bedded to massive. Fracturing may vary from slight to intense.		KJs — Intensely sheared Franciscan group rocks. Sheared rocks are relatively soft, friable and contain large quantities of clay minerals.		
					JURASSIC AND CRETACEOUS

Geologic contact

Fault, dotted where concealed

Strike and dip of bedding

EARTHQUAKE STABILITY

Artificial fill (Qaf)	Very low stability where placed over soft bay mud. Moderate to high stability where well compacted on firm base
Landslide deposits (Ql)	Very low stability.
Beach deposits (Qrb)	Low stability due to liquefaction potential.
Dune sand (Qd)	Moderate to high stability except for local liquefaction potential.
Quaternary deposits, undifferentiated (Qu)	Stability variable from low to moderate.
Franciscan group rocks, undifferentiated (KJu)	Generally high stability.
Intensely sheared Franciscan group rocks (KJs)	Low to moderate stability depending upon degree of saturation, shearing, and abundance of clay minerals.

2000 FEET

ENGINEERING GEOLOGIC MAP OF SAN FRANCISCO

SAN FRANCISCO SEISMIC SAFETY INVESTIGATION GEOLOGIC EVALUATION

June 1974

by John A. Blume & Associates, Engineers
(modified from Bonilla, 1971, and Schlocker, et al., 1958)

FIGURE III - 11

AREAS WITH LIMITING STREET GRADIENTS - 10% AND ABOVE

KAISER ENGINEERS

FIGURE III-12

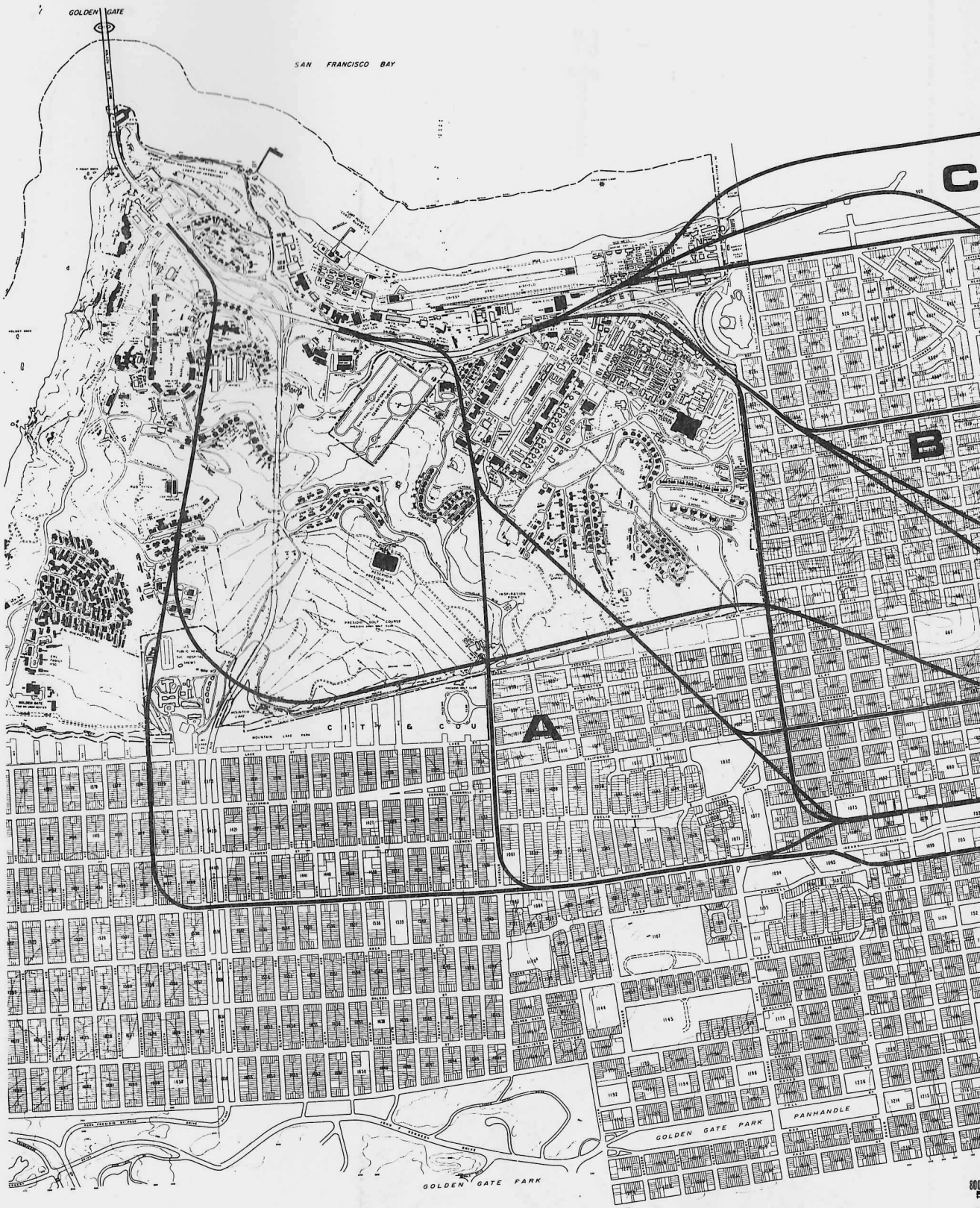

GOLDEN GATE
SAN FRANCISCO BAY
A
B
C
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK

FIGURE IV-1

SUBSURFACE ROUTE ALTERNATIVES

KAISER ENGINEERS

GOLDEN GATE
SAN FRANCISCO BAY
MOUNTAIN LAKE PARK
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK
800'

FIGURE IV-2

SINGLE SURFACE ROUTE ALTERNATIVES

KAISER ENGINEERS

GOLDEN GATE
SAN FRANCISCO BAY
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK

FIGURE IV-3

DISPERSED SURFACE ROUTE ALTERNATIVES

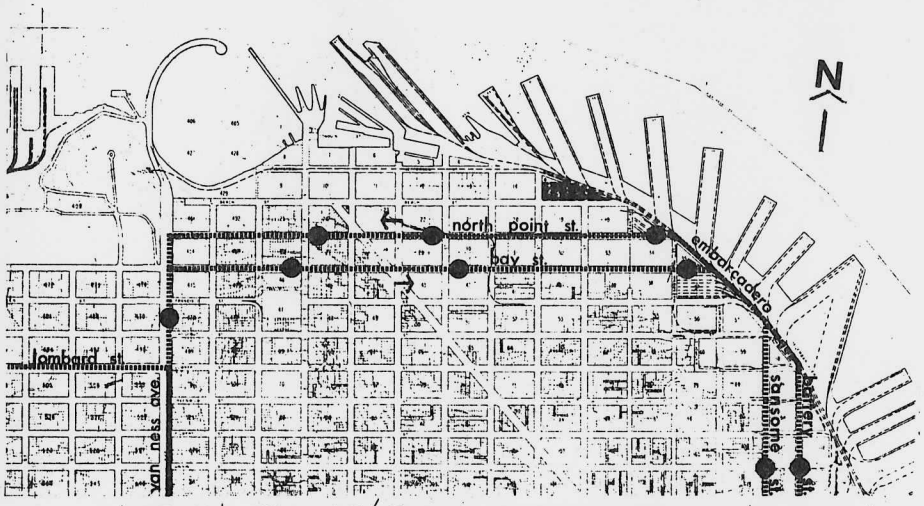
KAISER ENGINEERS

GOLDEN GATE
SAN FRANCISCO BAY
PACIFIC OCEAN
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK
800

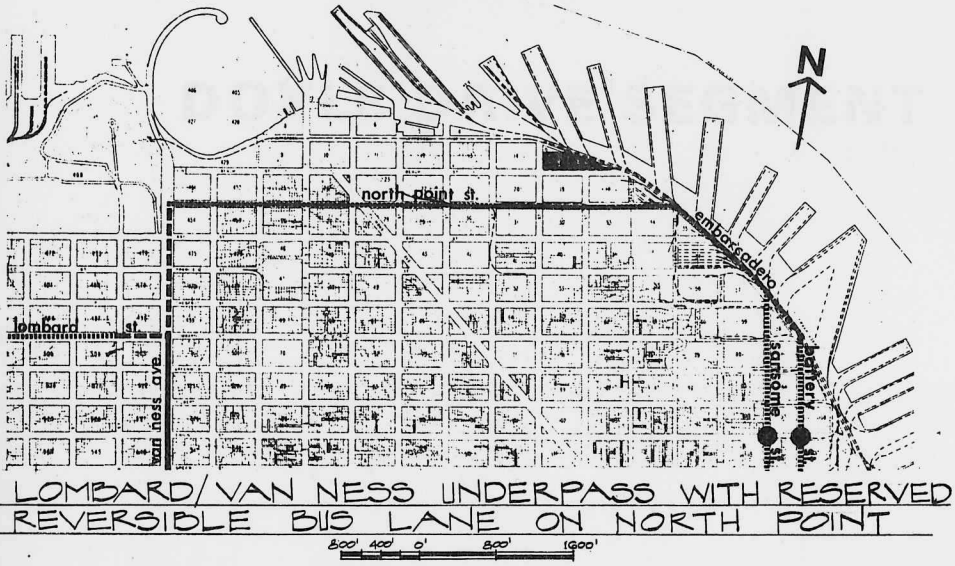
FIGURE V-1

SINGLE SURFACE ROUTE SYSTEM

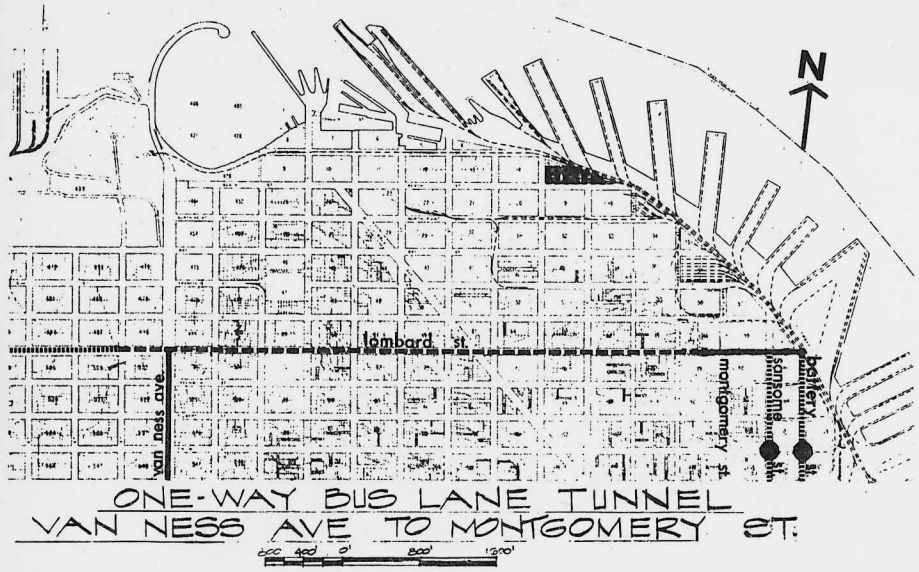
KAISER ENGINEERS



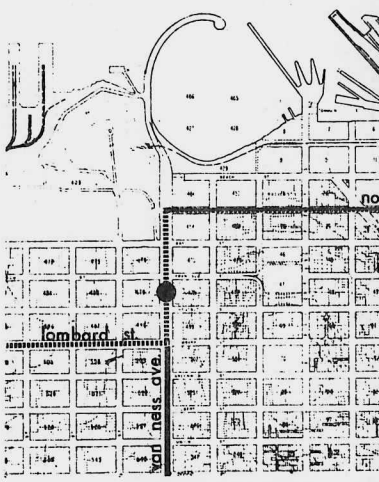
NORTH POINT/BAY STREETS ONE-WAY COUPLE WITH RESERVED BUS LANES



LOMBARD/VAN NESS UNDERPASS WITH RESERVED REVERSIBLE BUS LANE ON NORTH POINT



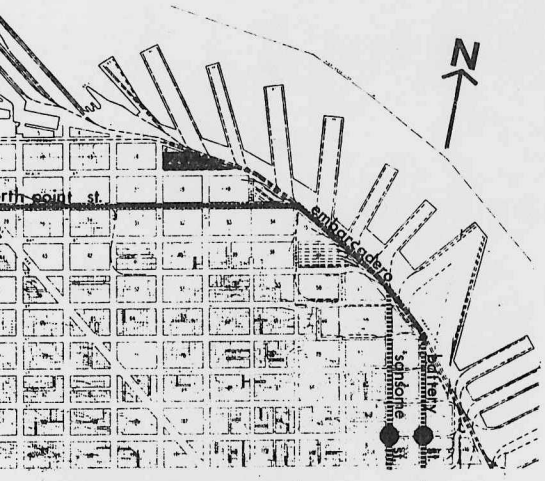
ONE-WAY BUS LANE TUNNEL VAN NESS AVE TO MONTGOMERY ST.



RESERVED R
ON NORTH P

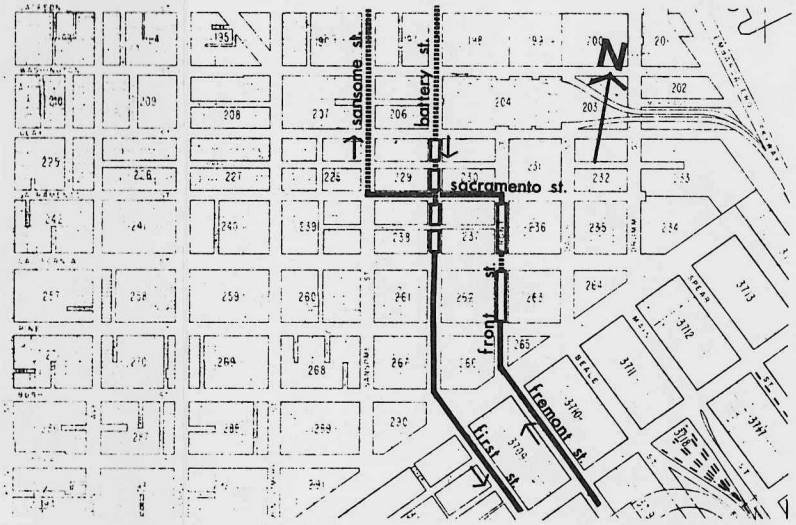
LEGEN

BUS ROUTE
ONE-WAY B
RESERVED
RESERVED
F.D. BUS L
BUS STOP



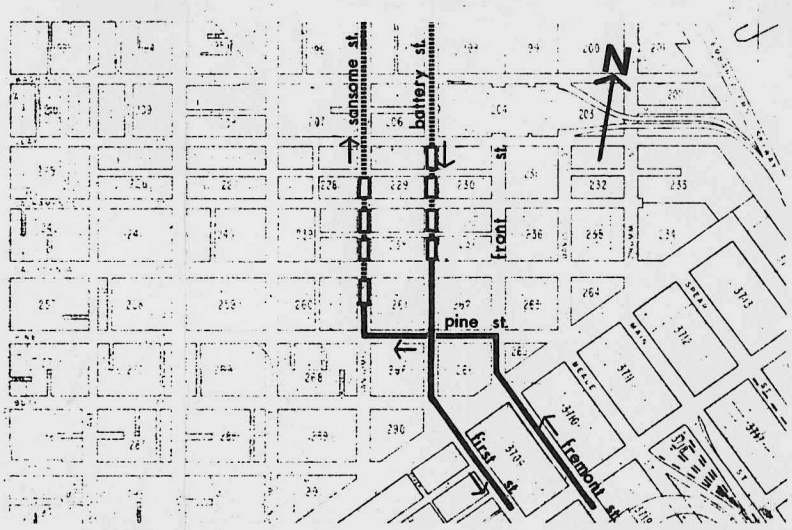
REVERSIBLE BUS LANE
POINT STREET

800' 1600'



FRONT/BATTERY STREETS
FINANCIAL DISTRICT LOADING ZONES

400' 200' 0' 400' 800'



BATTERY/SANSOME STREETS
FINANCIAL DISTRICT LOADING ZONES

400' 200' 0' 400' 800'

D

IN MIXED TRAFFIC

BUS LANE TUNNEL

BUS LANE

REVERSIBLE BUS LANE

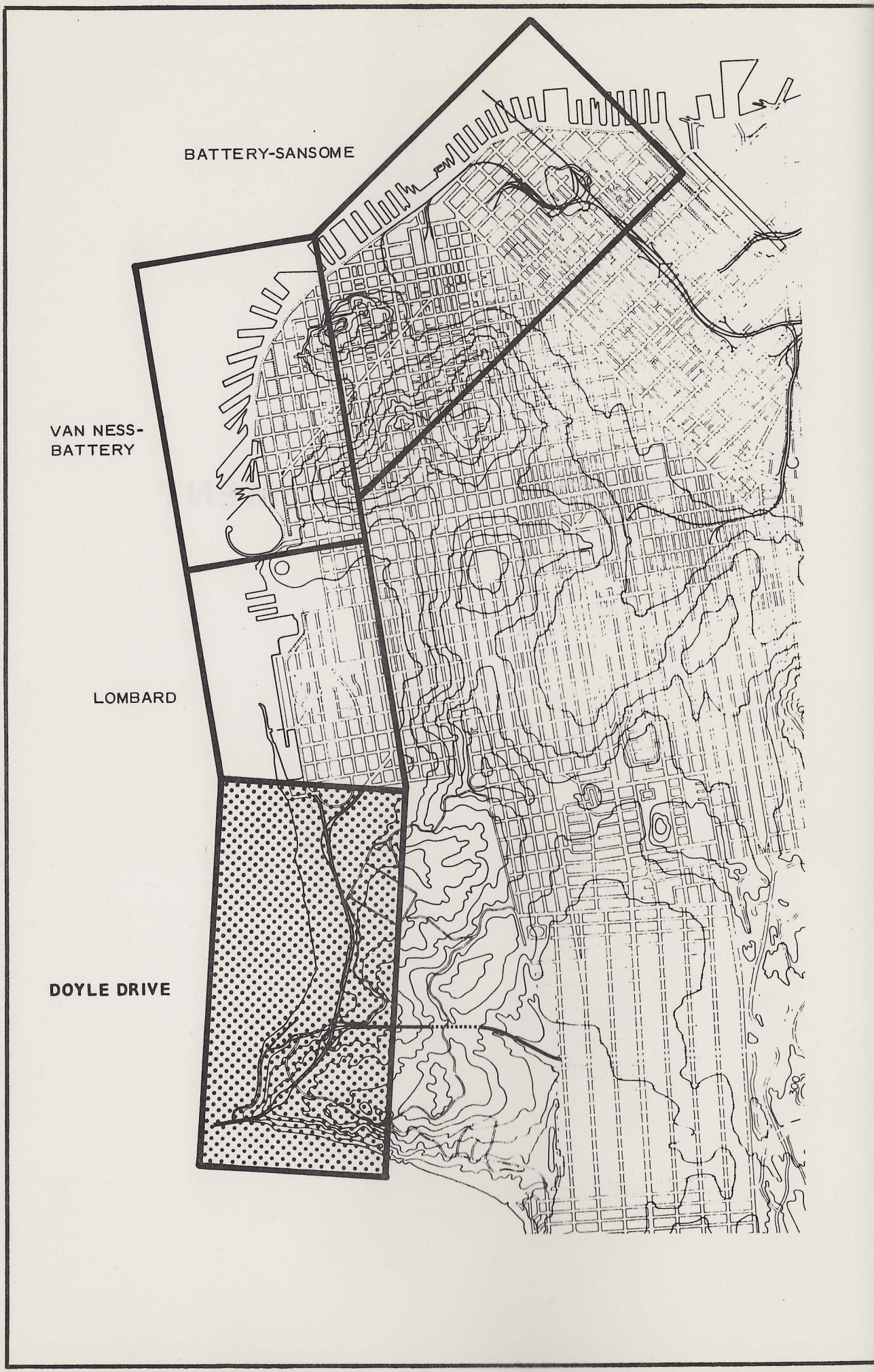
OADING ZONE

FIGURE V-2

VAN NESS - BATTERY ALTERNATIVES AND FINANCIAL DISTRICT LOADING ZONE ALTERNATIVES

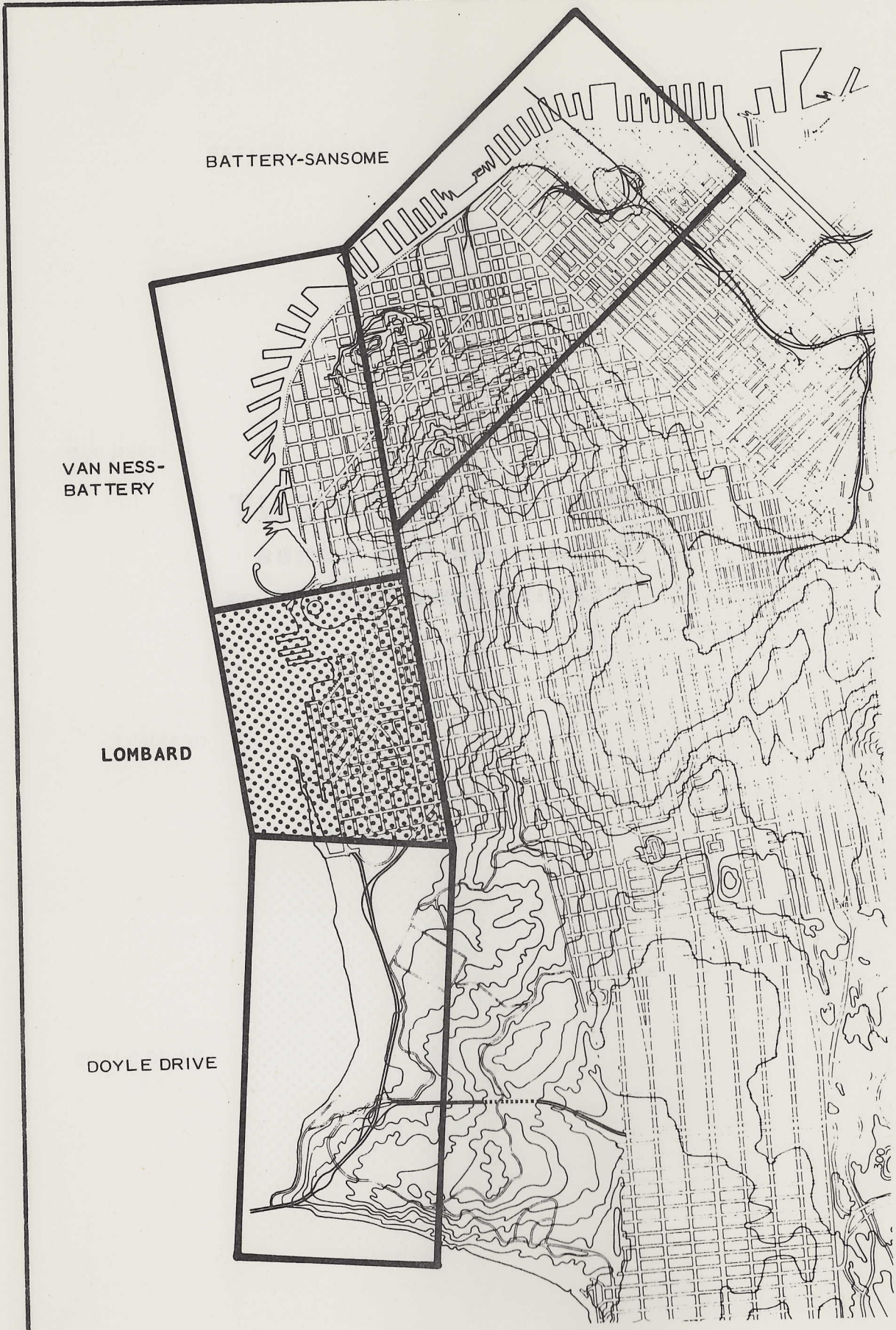
KAISER ENGINEERS

DOYLE DRIVE SEGMENT


BATTERY-SANSOME
VAN NESS-
BATTERY
LOMBARD
DOYLE DRIVE

LOMBARD SEGMENT

- Reserved Bus Lanes
- Contraflow Bus Lanes


BATTERY-SANSOME
VAN NESS-
BATTERY
LOMBARD
DOYLE DRIVE

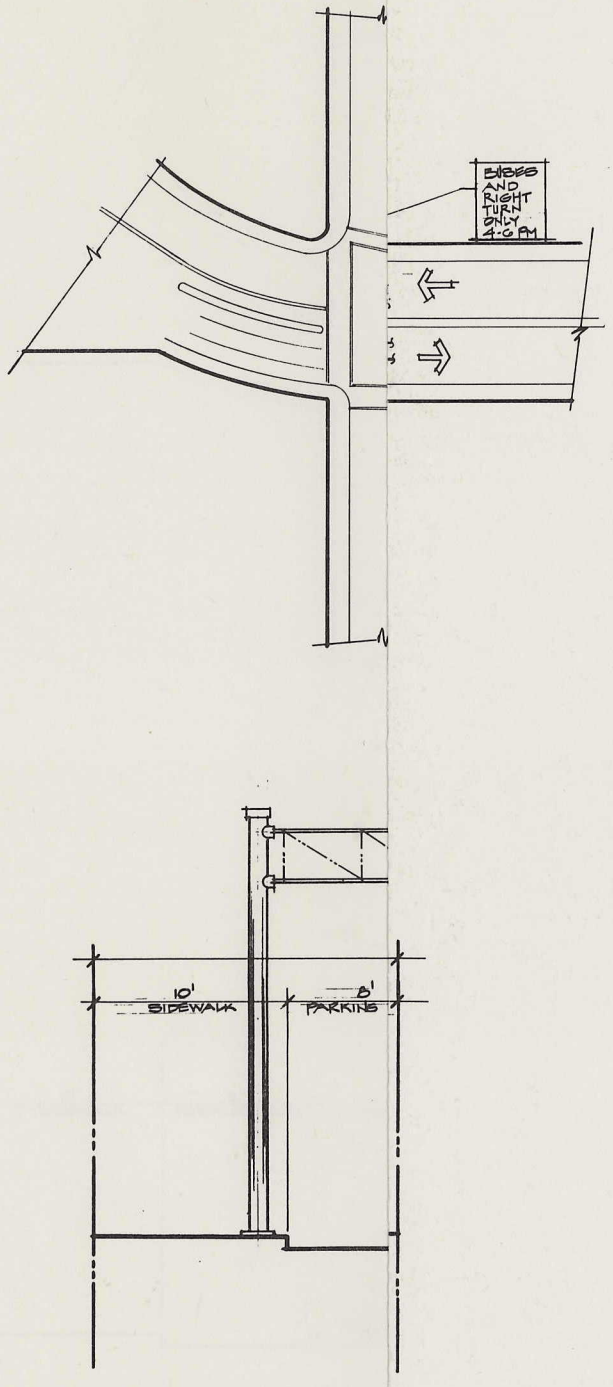
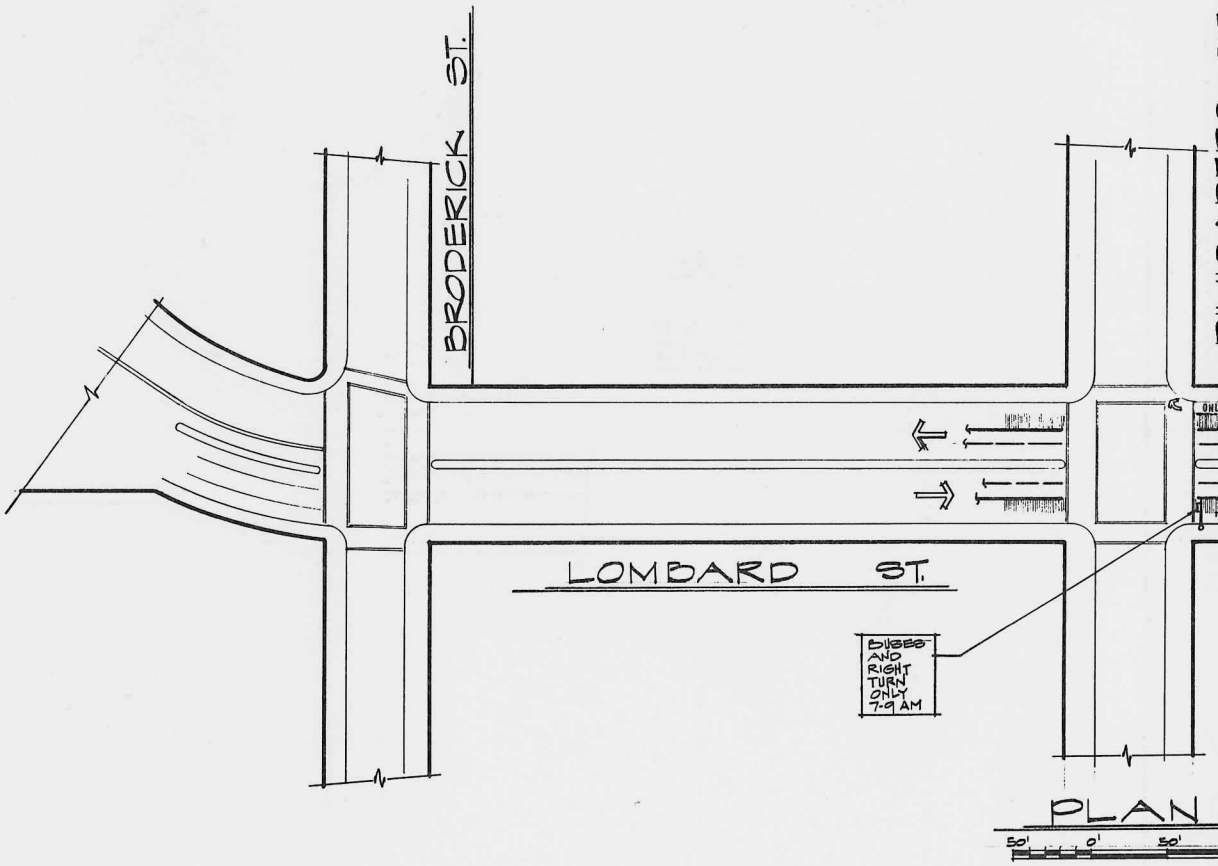
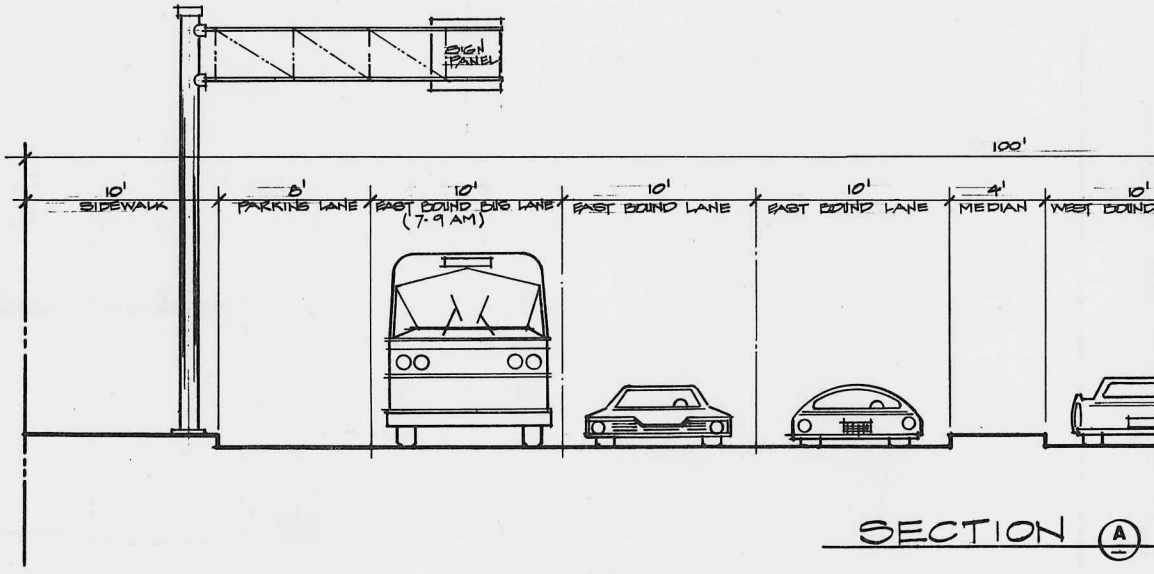


FIGURE V-3

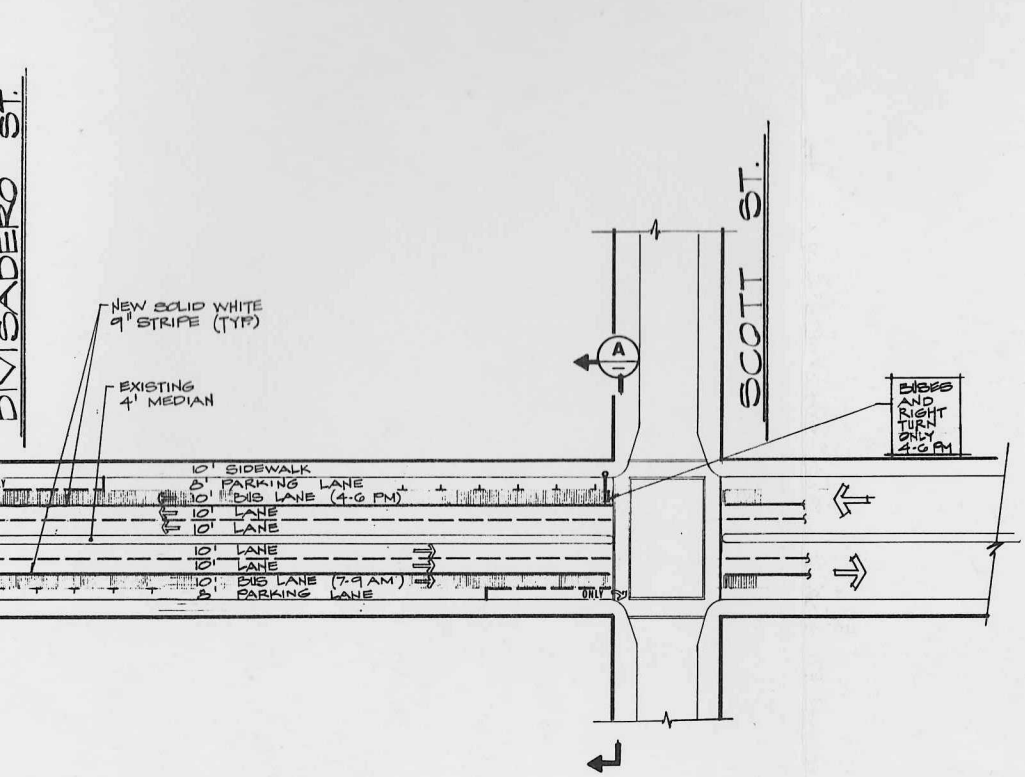
LOMBARD STREET RESERVED LANES

KAISER ENGINEERS


BRODERICK ST.
LOMBARD ST.
BIKES AND RIGHT TURN ONLY 7-9 AM
PLAN
50'
0'
50'


SIGN PANEL
100'
10'
SIDEWALK
8'
PARKING LANE
10'
EAST BOUND BIG LANE (7-9 AM)
10'
EAST BOUND LANE
10'
EAST BOUND LANE
4'
MEDIAN
10'
WEST BOUND

SECTION (A)



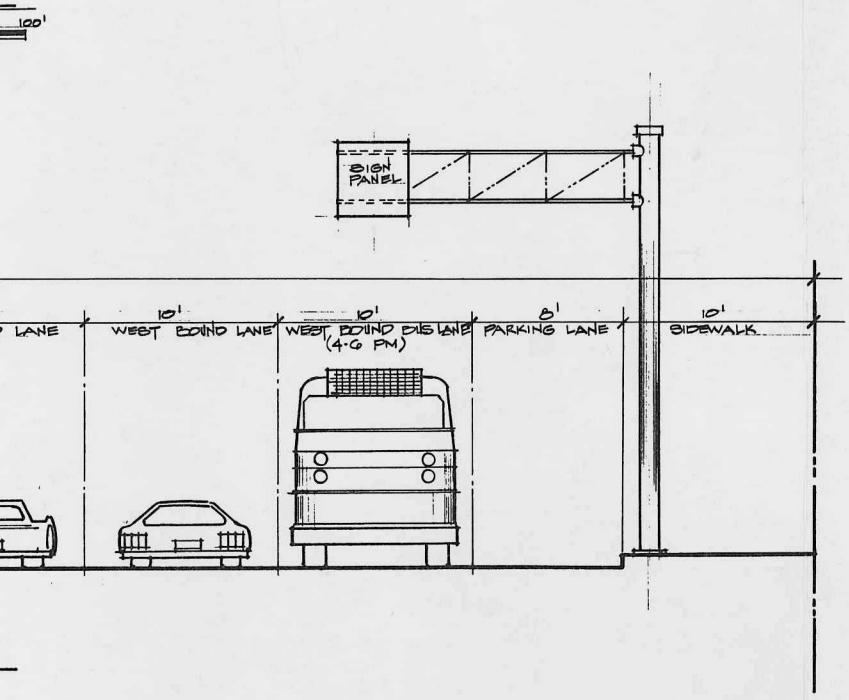
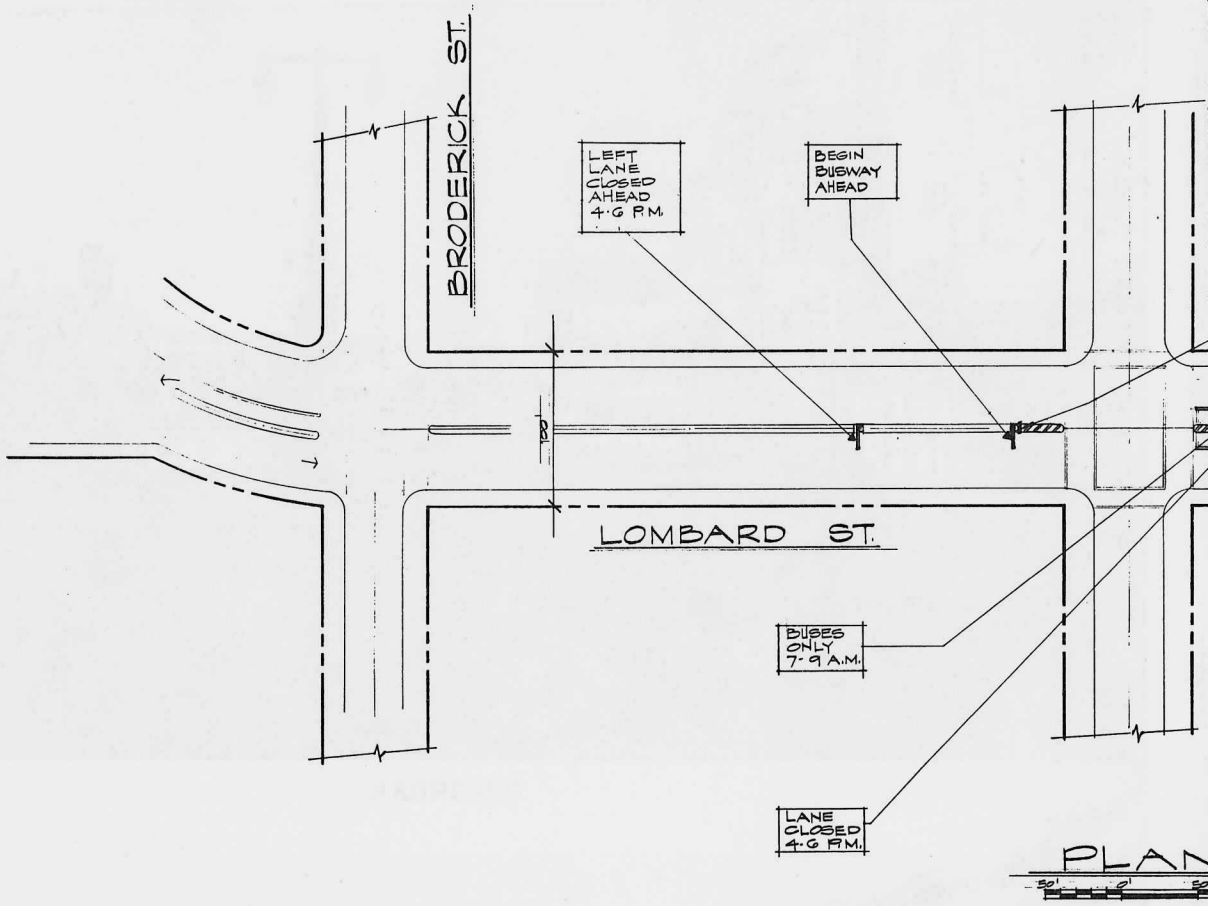
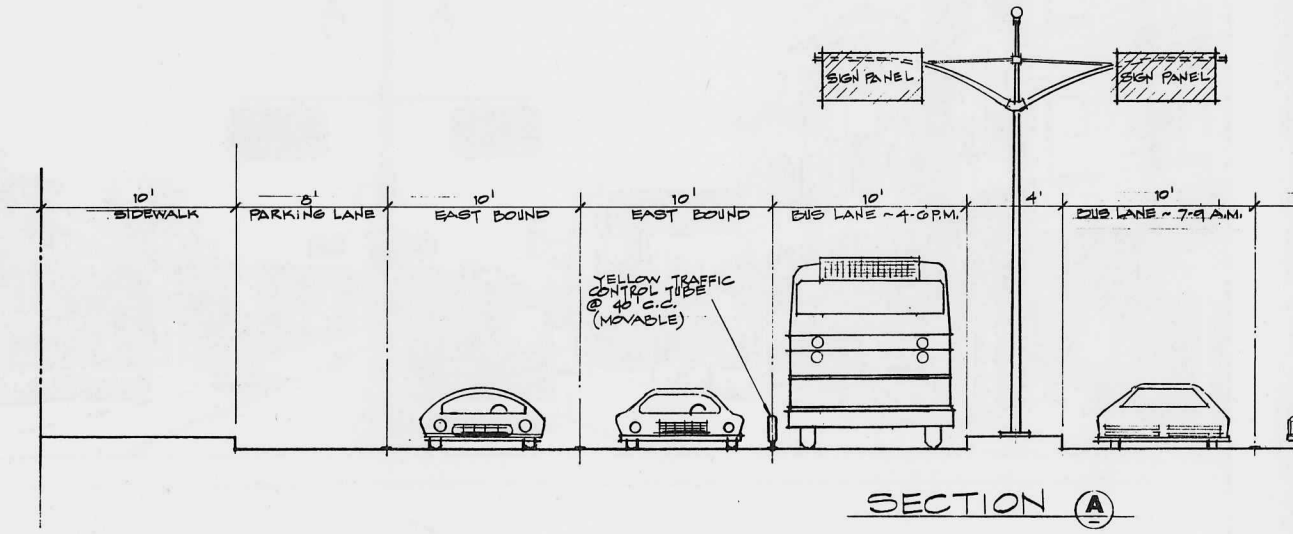


FIGURE V-3

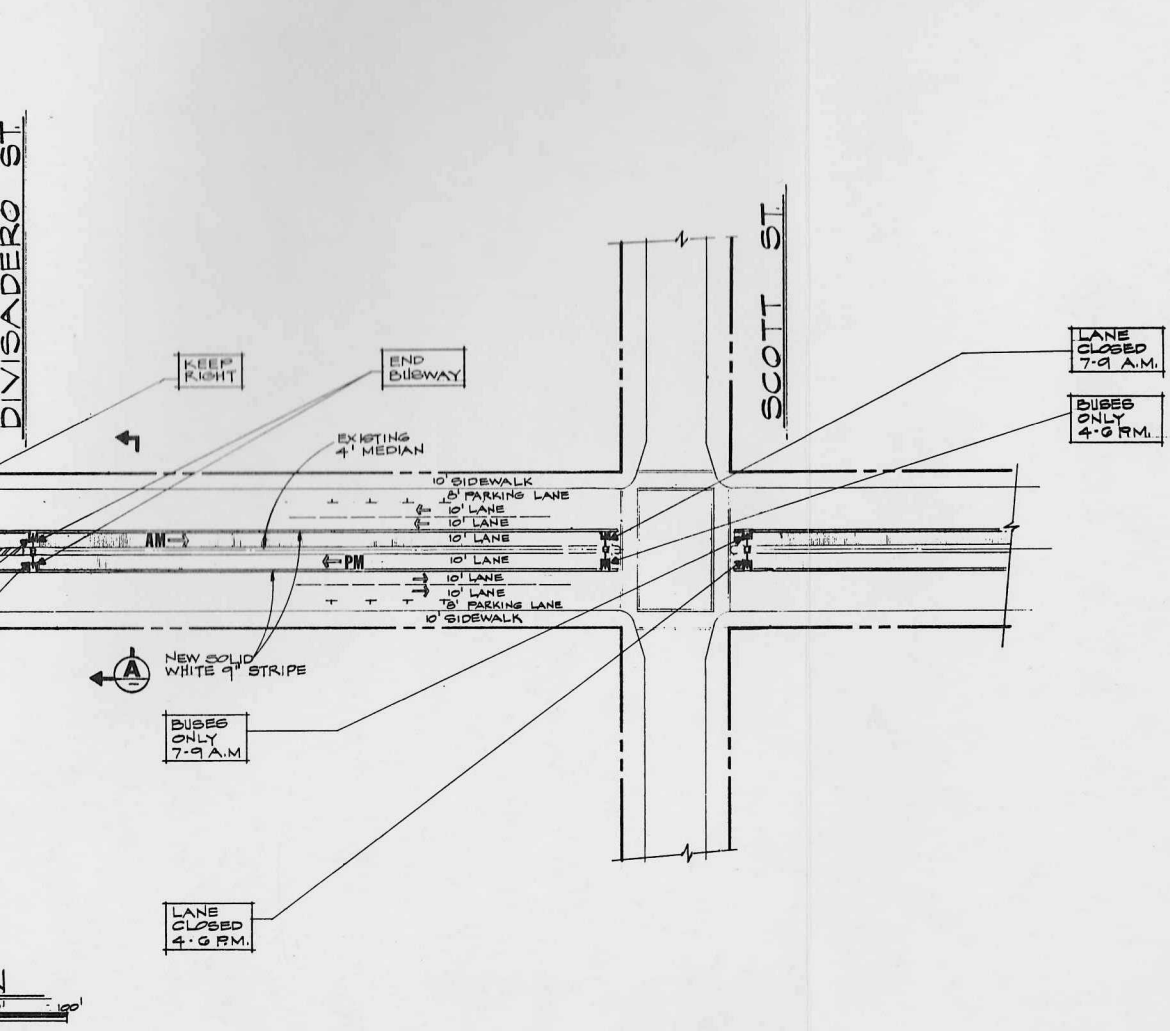
LOMBARD STREET RESERVED LANES

KAISER ENGINEERS


BRODERICK ST.
LEFT LANE CLOSED AHEAD 4-6 P.M.
BEGIN BUSWAY AHEAD
LOMBARD ST.
BUSES ONLY 7-9 A.M.
LANE CLOSED 4-6 P.M.
PLAN


SIGN PANEL
SIGN PANEL
10' SIDEWALK
8' PARKING LANE
10' EAST BOUND
10' EAST BOUND
10' BUS LANE ~ 4-6 P.M.
4'
10' BUS LANE ~ 7-9 A.M.
YELLOW TRAFFIC CONTROL TUBE @ 40' C.C. (MOVABLE)

SECTION (A)



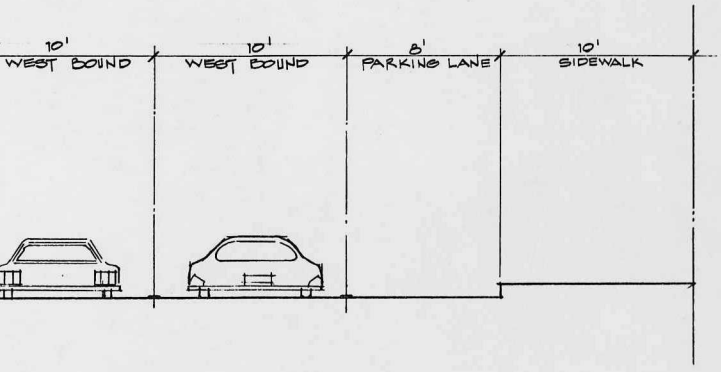
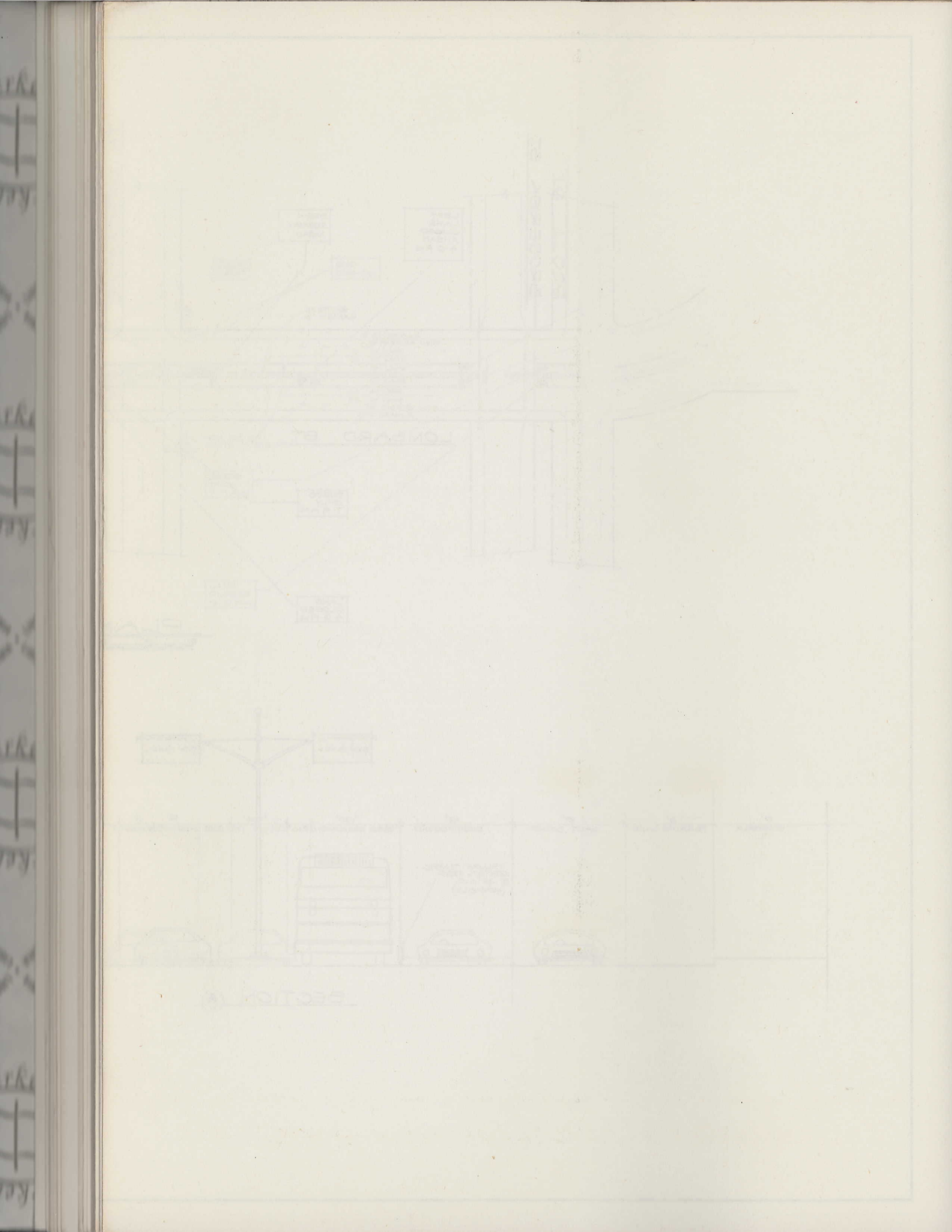


FIGURE V-4

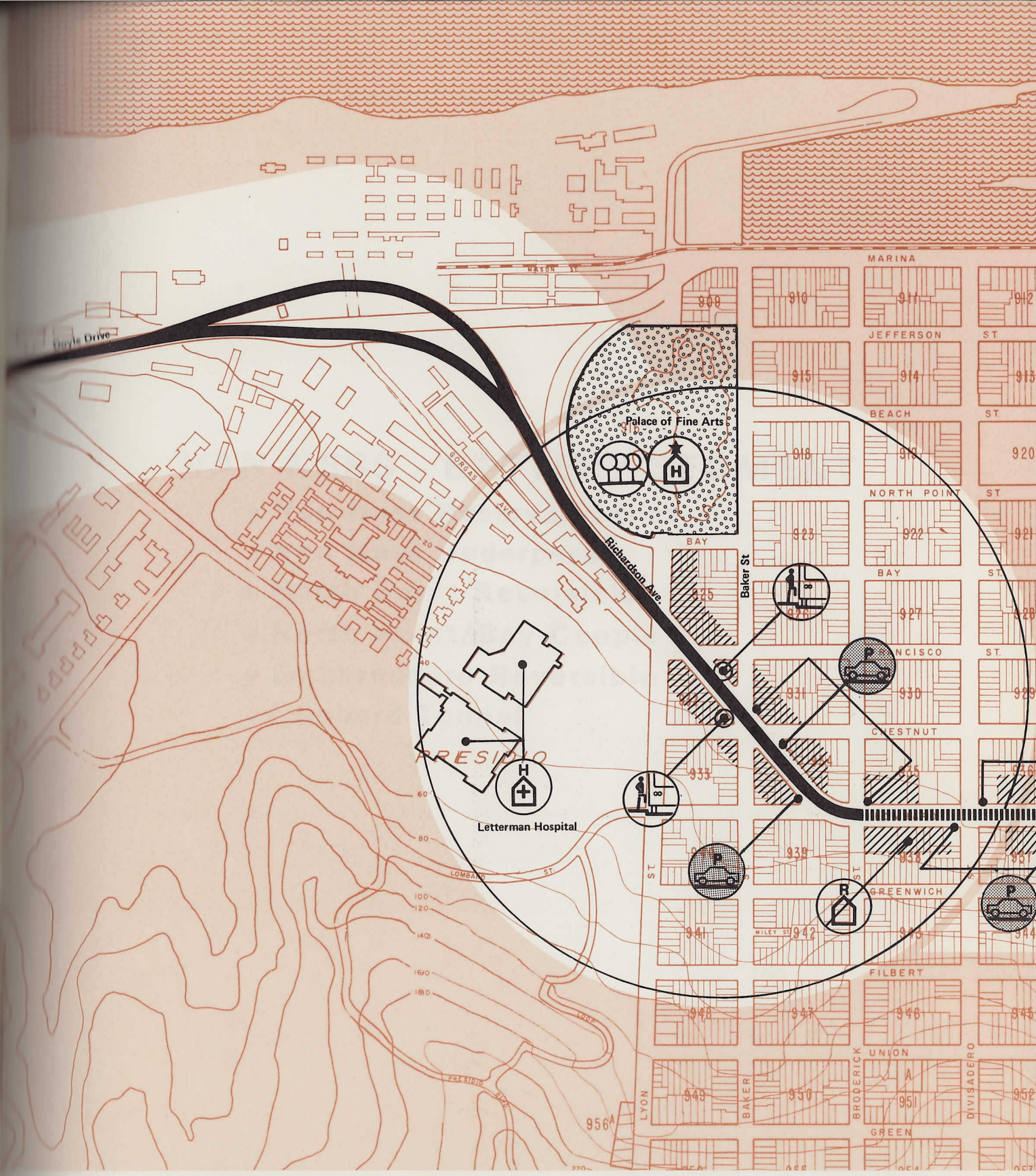
LOMBARD STREET CONTRAFLOW LANES

KAISER ENGINEERS

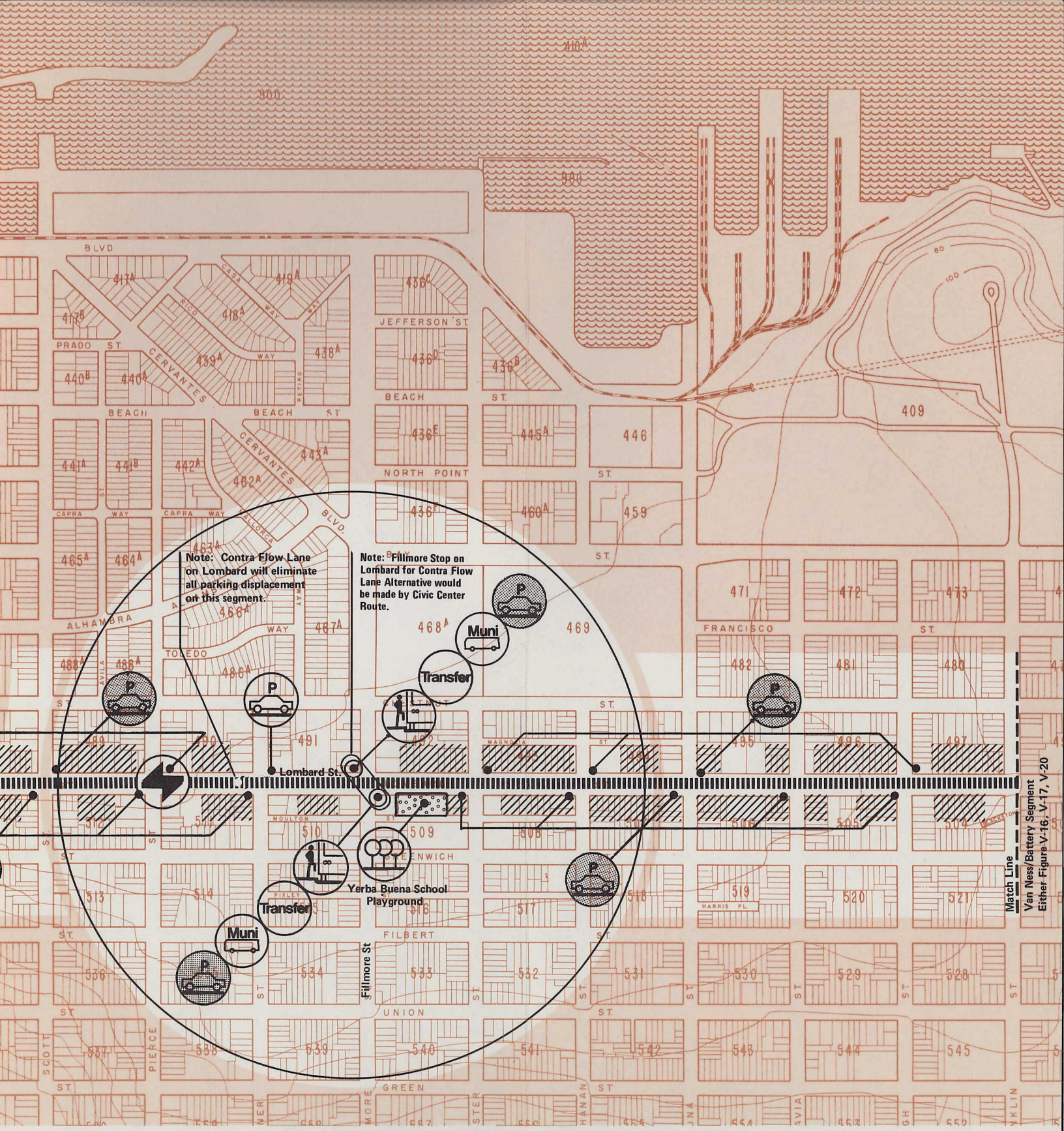


LOMBARD STREET CONTRA-FLOW LANES

FIGURE V - 5



Hospital	Schools/Colleges	Historic Landmark	Parking	Elevator
Open Space	Residential Noise Impact Potential	Landmark	Demand Stop	Underground R.O.W. Easement
Structure	Noise Impact Potential	Displaced Activity	Business/ Employment	Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

5 Min. Walk To Station

R = 1320'

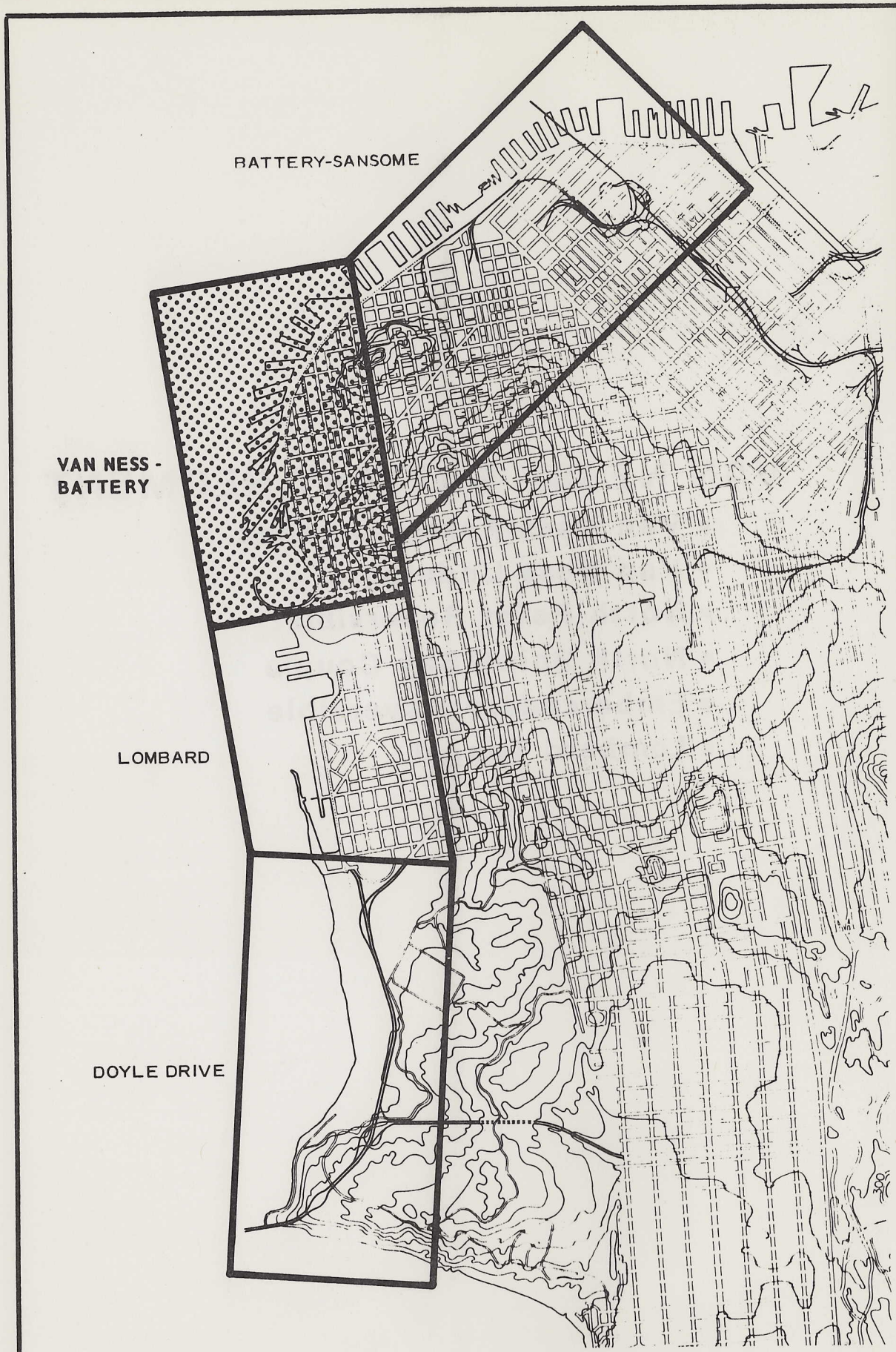
LOMBARD

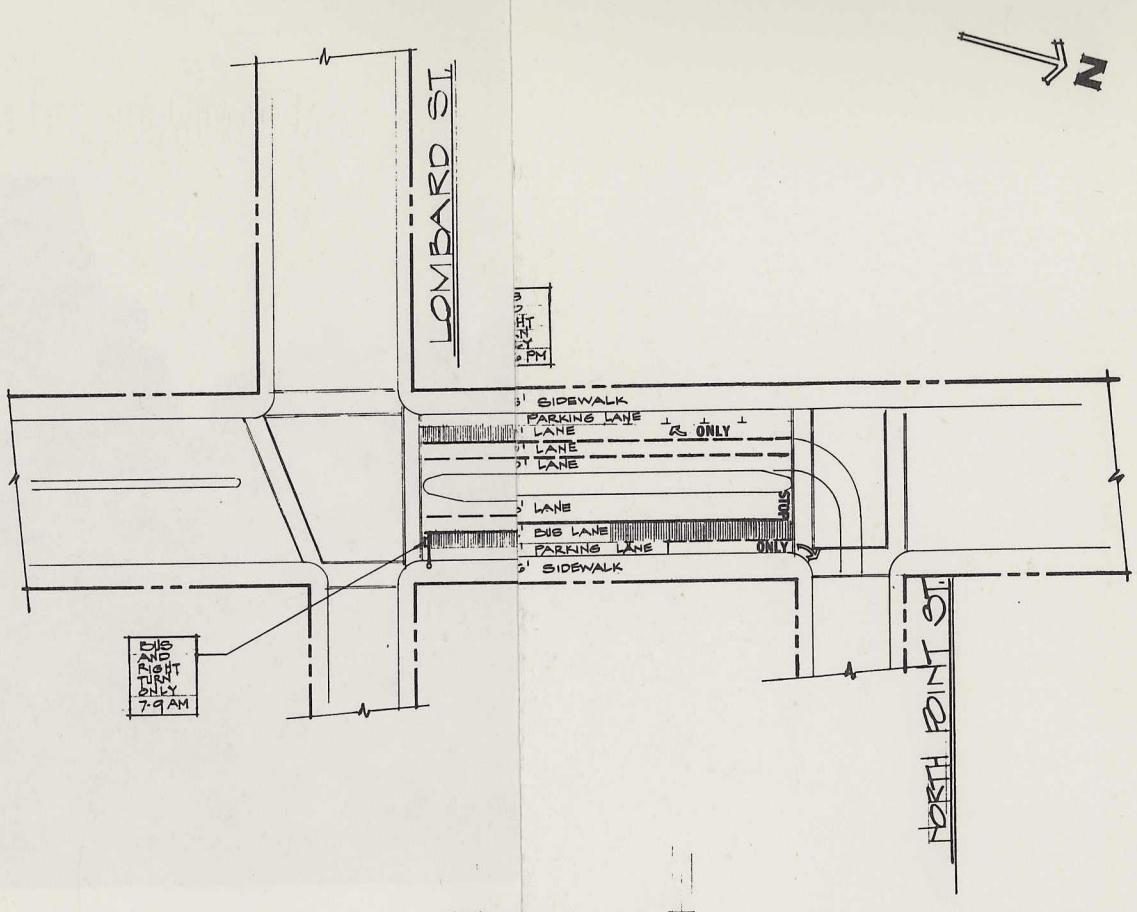
(IMPACT MAP)

FIGURE V - 6

VAN NESS - BATTERY SEGMENT

- Van Ness Reserved Lanes
- Van Ness Underpass
- North Point Reversible
- North Point/Bay Couple
- Embarcadero Reversible
- Lombard Tunnel


BATTERY-SANSOME
VAN NESS -
BATTERY
LOMBARD
DOYLE DRIVE



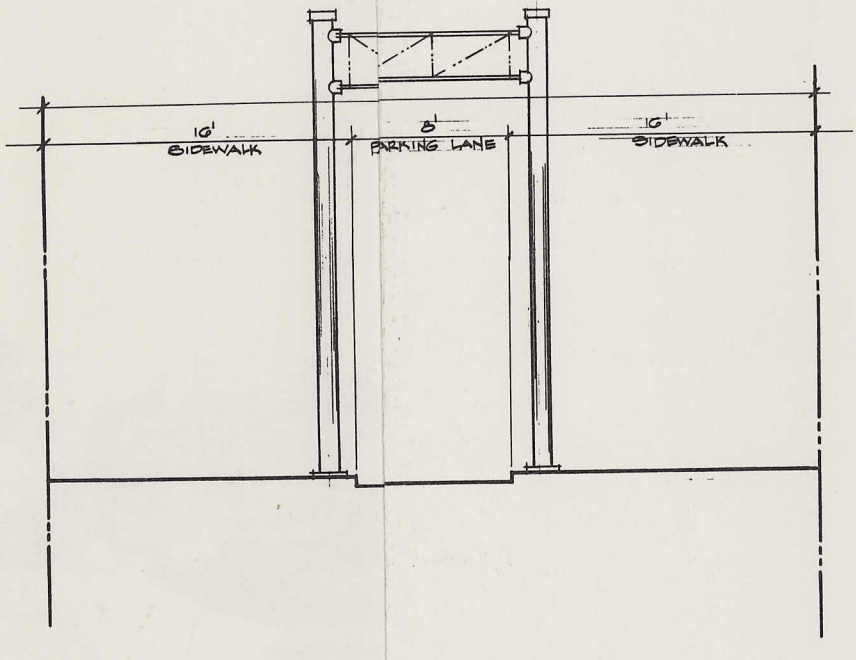
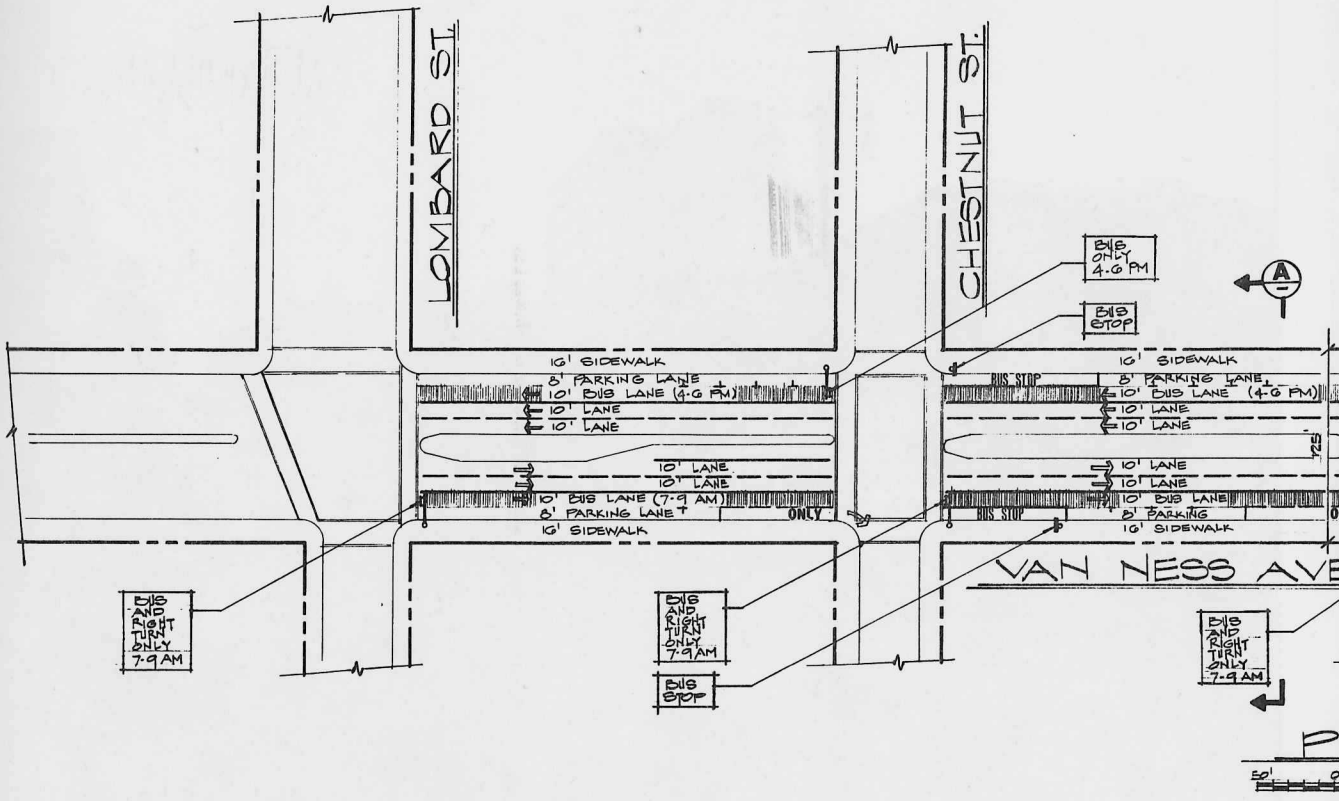
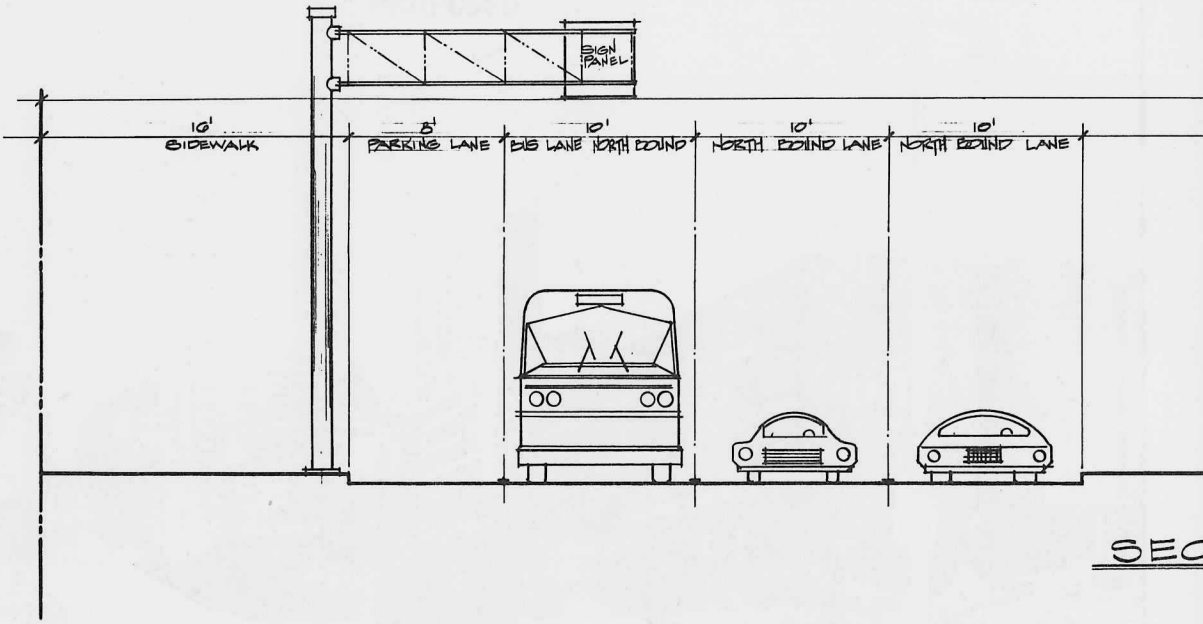


FIGURE V-7

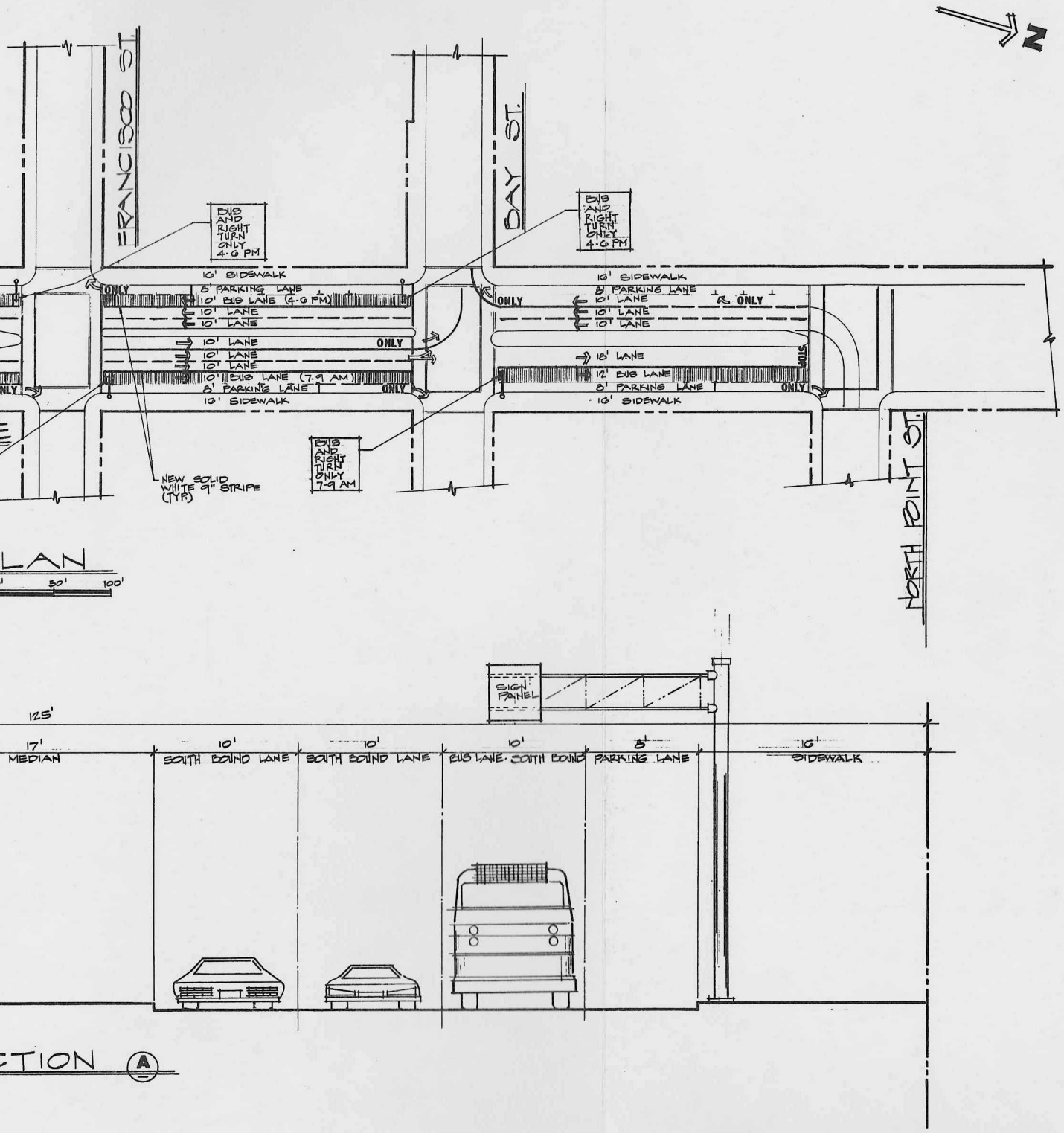
VAN NESS AVENUE RESERVED LANES

KAISER ENGINEERS


LOMBARD ST.
CHESTNUT ST.
BUS ONLY 4-6 PM
BUS STOP
16' SIDEWALK
8' PARKING LANE
10' BUS LANE (4-6 PM)
10' LANE
10' LANE
10' LANE
10' LANE
10' BUS LANE (7-9 AM)
8' PARKING LANE
16' SIDEWALK
ONLY
BUS STOP
8' PARKING
16' SIDEWALK
VAN NESS AVE
BUS AND RIGHT TURN ONLY 7-9 AM
BUS AND RIGHT TURN ONLY 7-9 AM
BUS STOP
BUS AND RIGHT TURN ONLY 7-9 AM
125'
50'


SIGN PANEL
16' SIDEWALK
8' PARKING LANE
10' BUS LANE NORTH BOUND
10' NORTH BOUND LANE
10' NORTH BOUND LANE

SEC

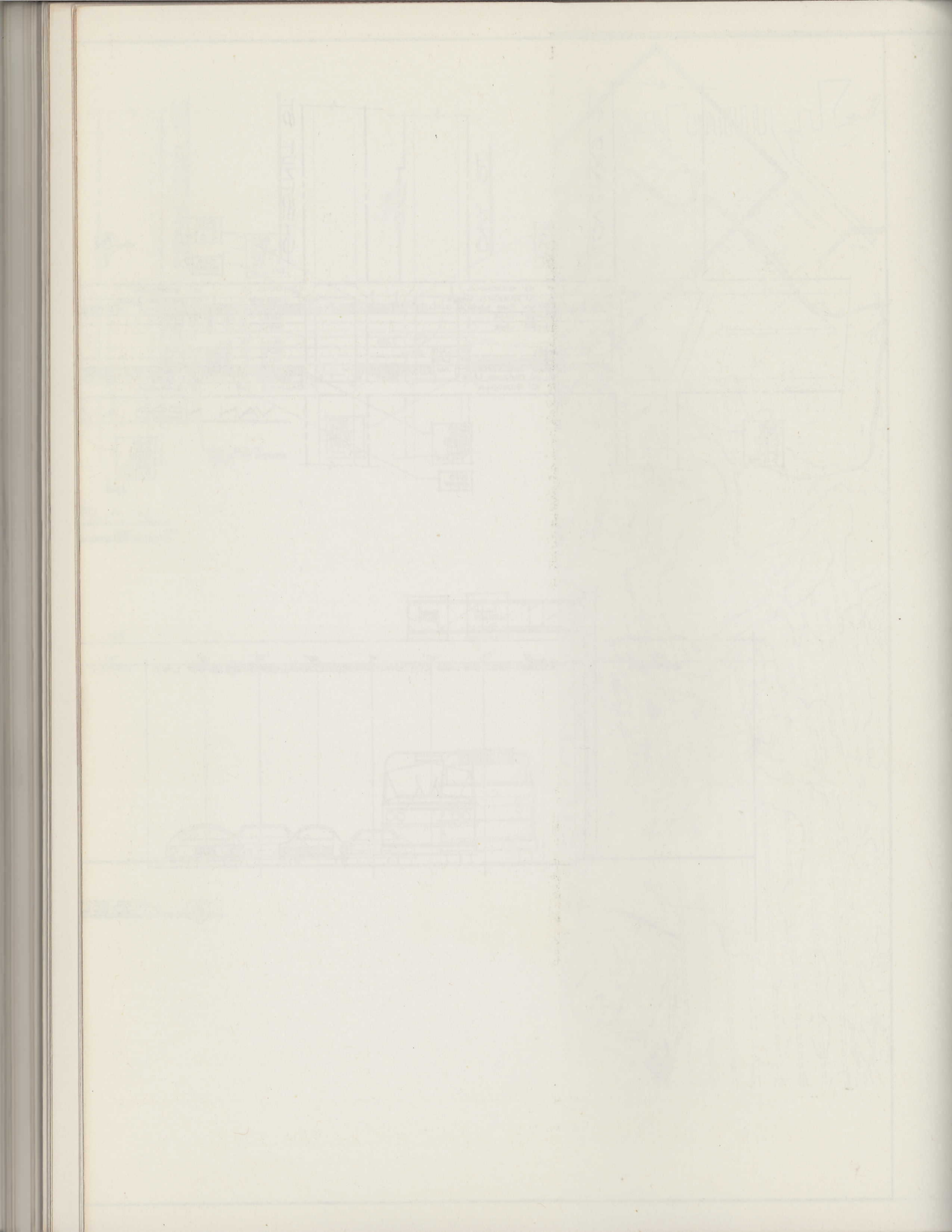


CTION (A)

FIGURE V-7

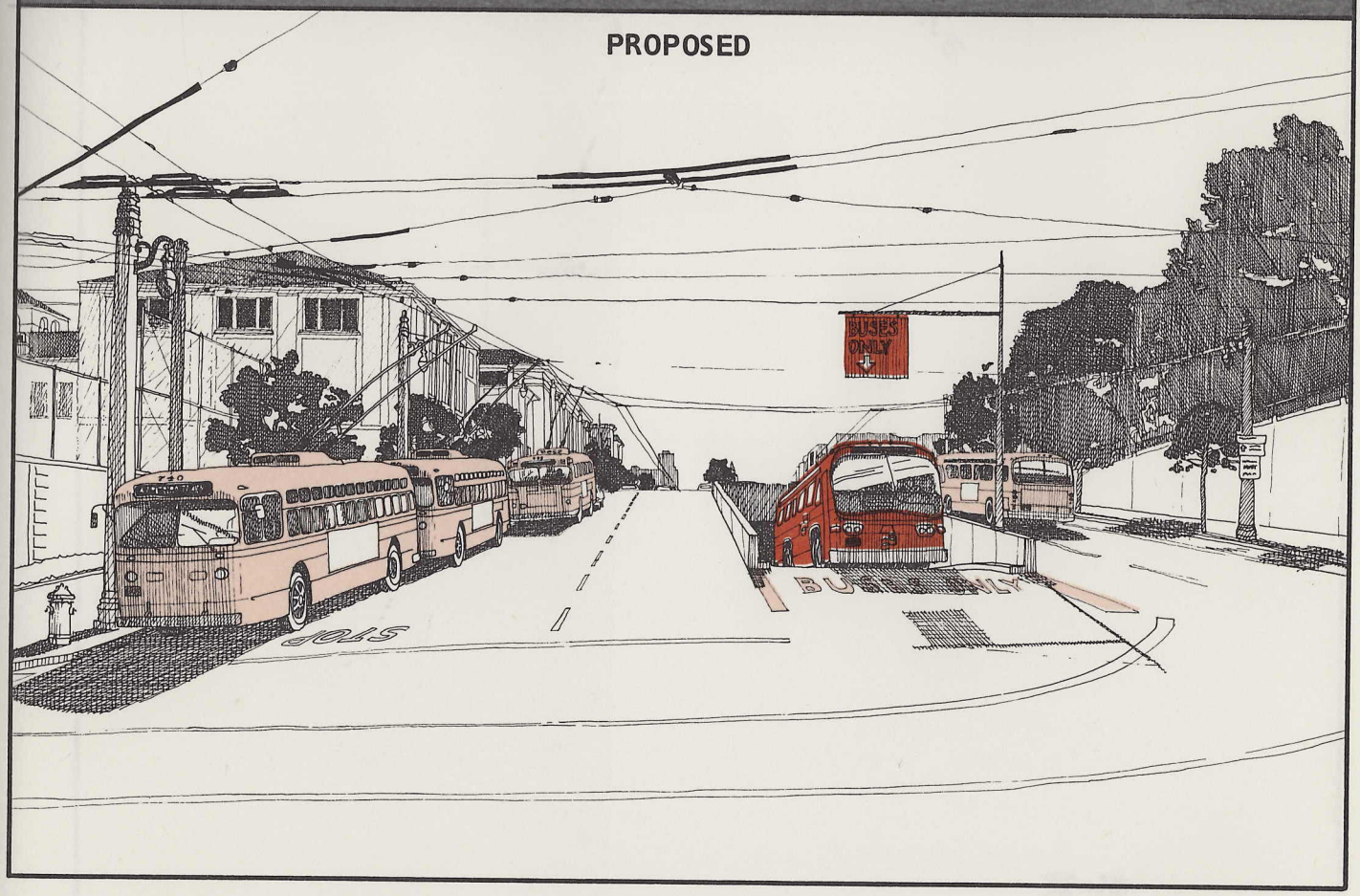
VAN NESS AVENUE RESERVED LANES

KAISER ENGINEERS



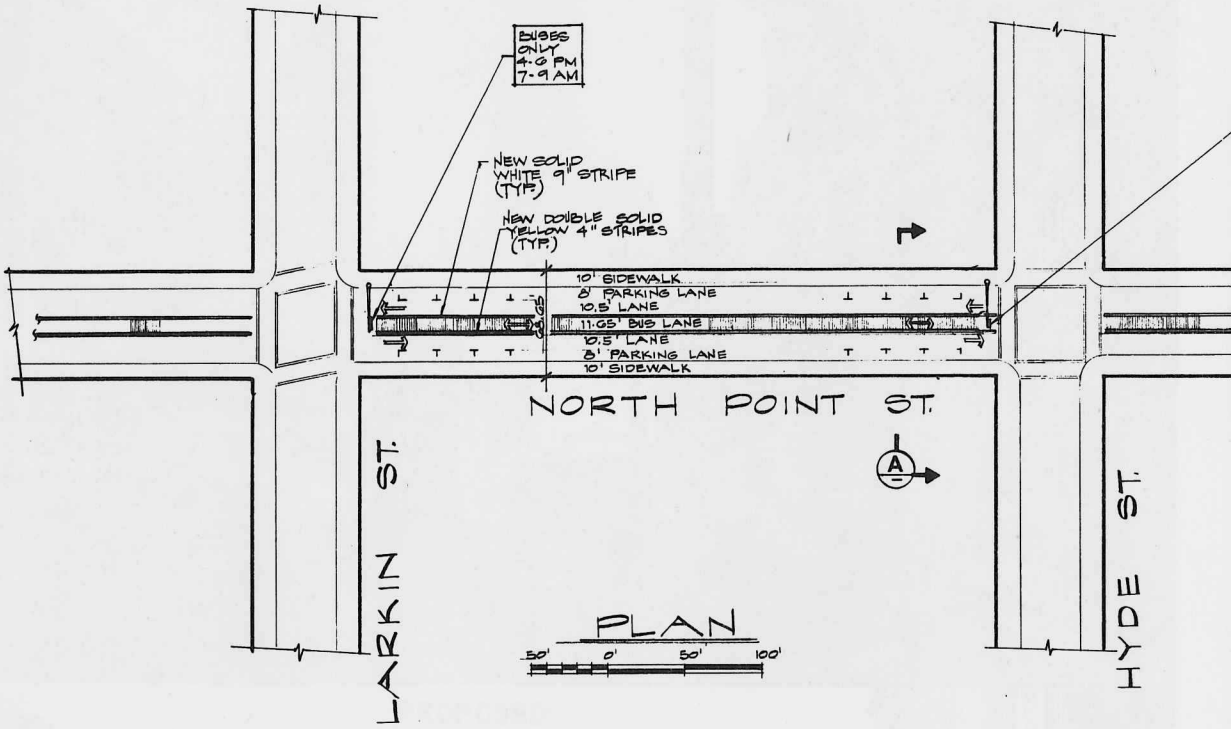
TUNNEL PORTAL AT VAN NESS AND LOMBARD

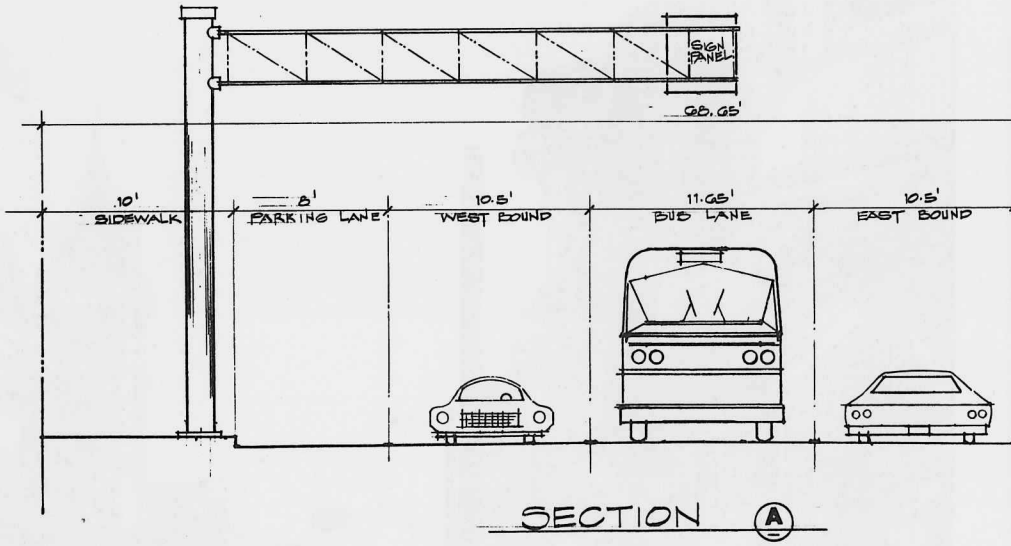
FIGURE V - 8

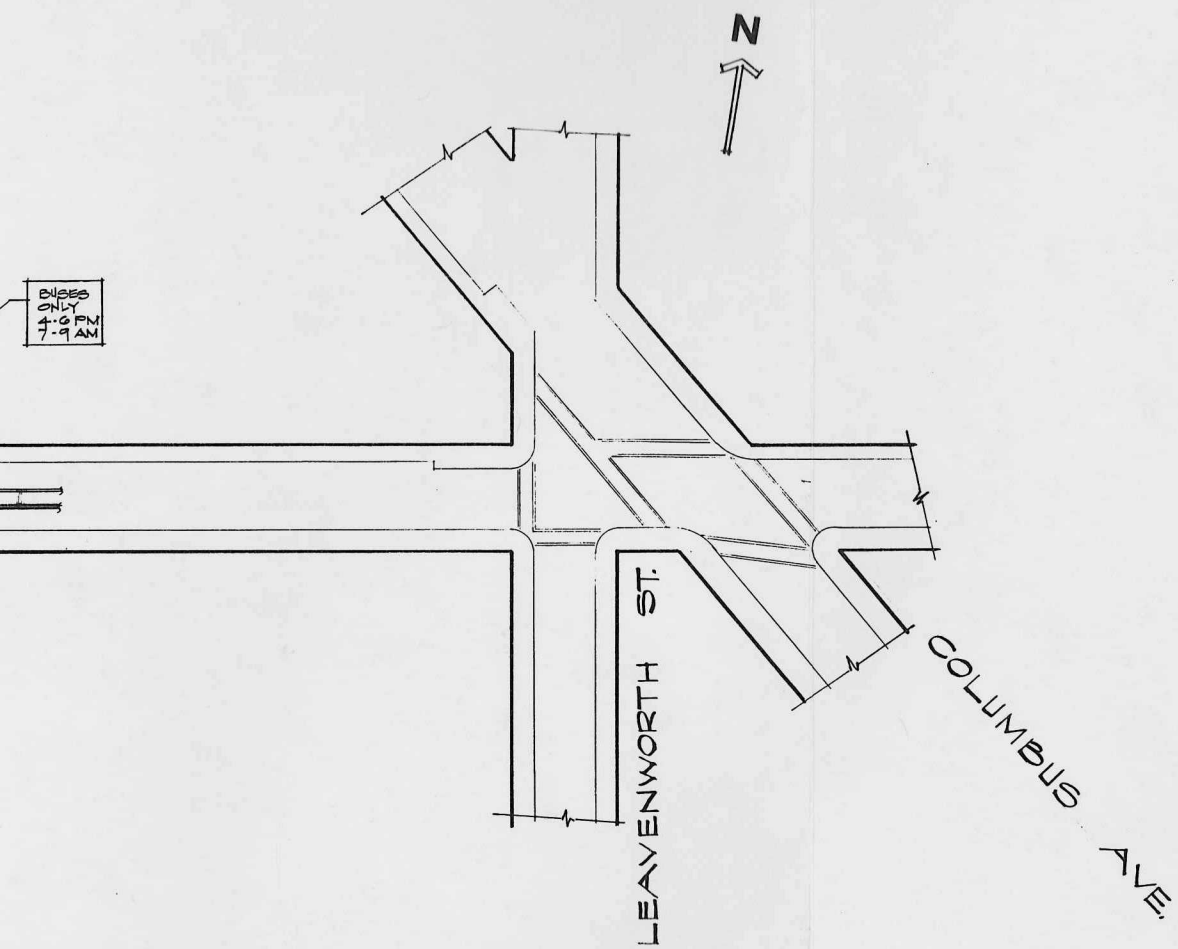


TUNNEL PORTAL AT VAN NESS AND NORTH POINT

FIGURE V - 9


BUSES ONLY 4-6 PM 7-9 AM
NEW SOLID WHITE 9" STRIPE (TYP.)
NEW DOUBLE SOLID YELLOW 4" STRIPES (TYP.)
10' SIDEWALK
8' PARKING LANE
10.5' LANE
11.65' BUS LANE
10.5' LANE
8' PARKING LANE
10' SIDEWALK
NORTH POINT ST.
LARKIN ST.
HYDE ST.
A
PLAN
50' 0' 50' 100'


SIGN PANEL
28.65'
10' SIDEWALK
8' PARKING LANE
10.5' WEST BOUND
11.65' BUS LANE
10.5' EAST BOUND
SECTION A



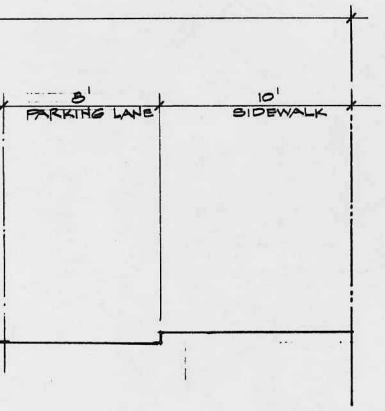
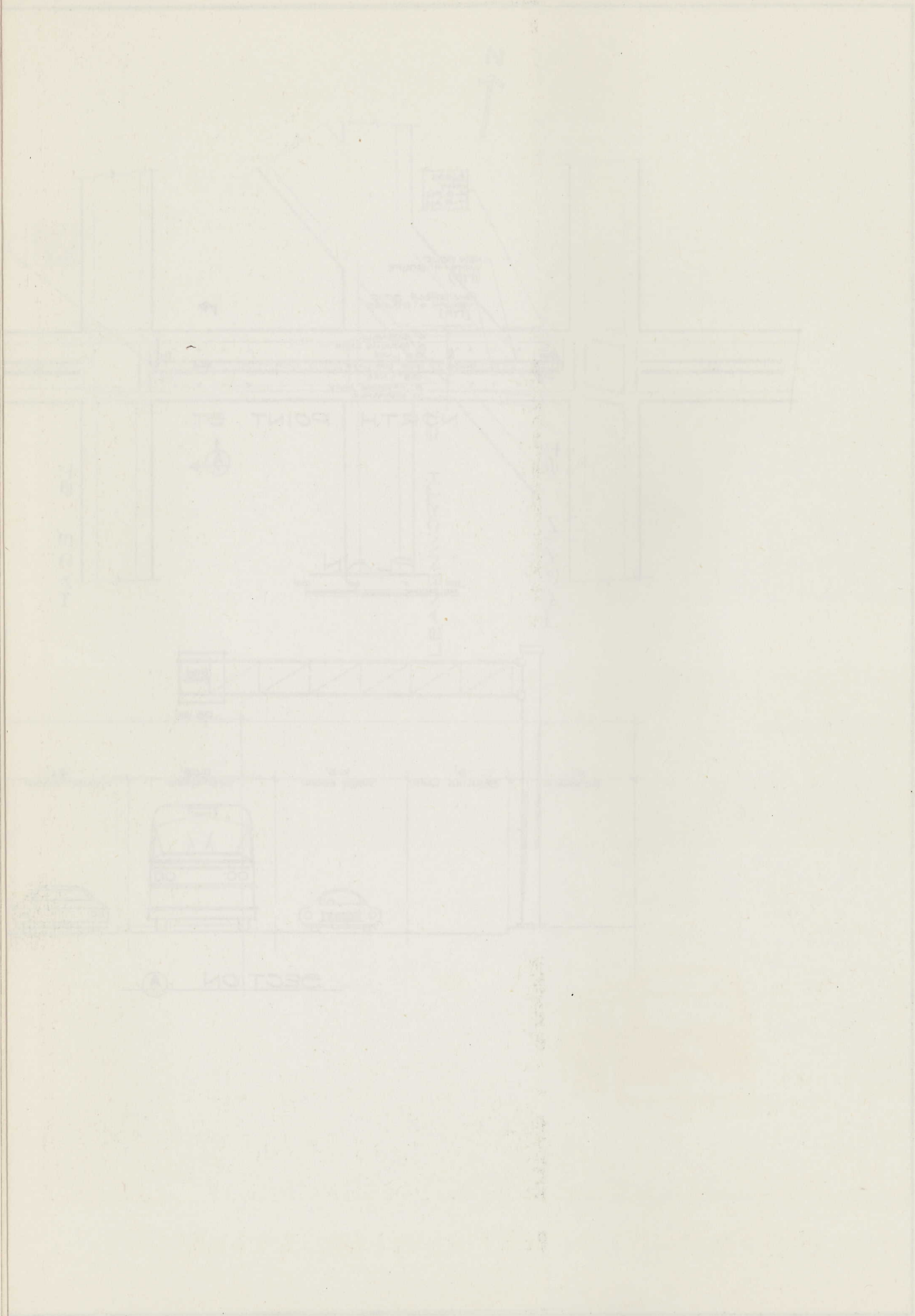


FIGURE V-10

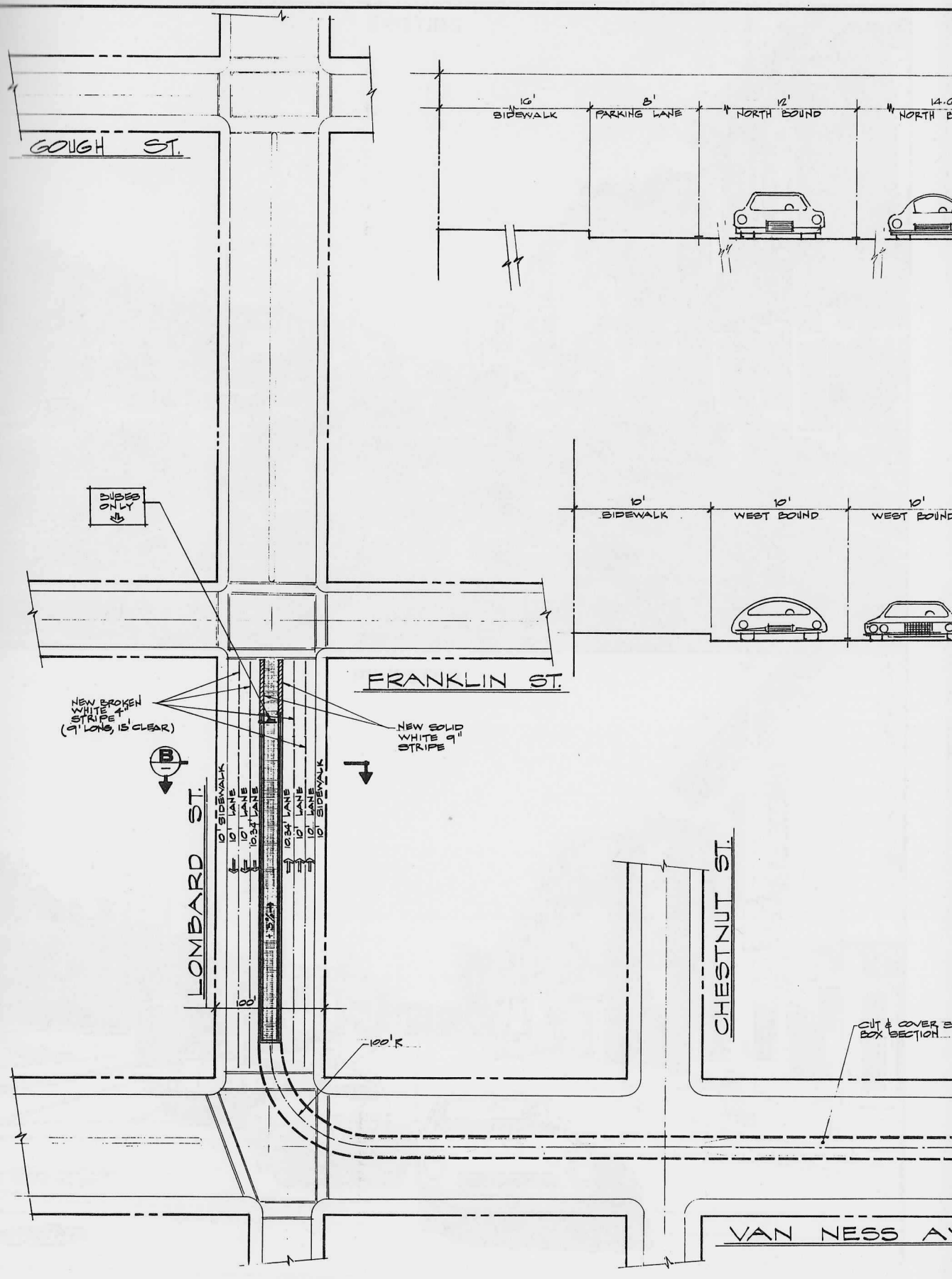
NORTH POINT STREET REVERSIBLE LANE

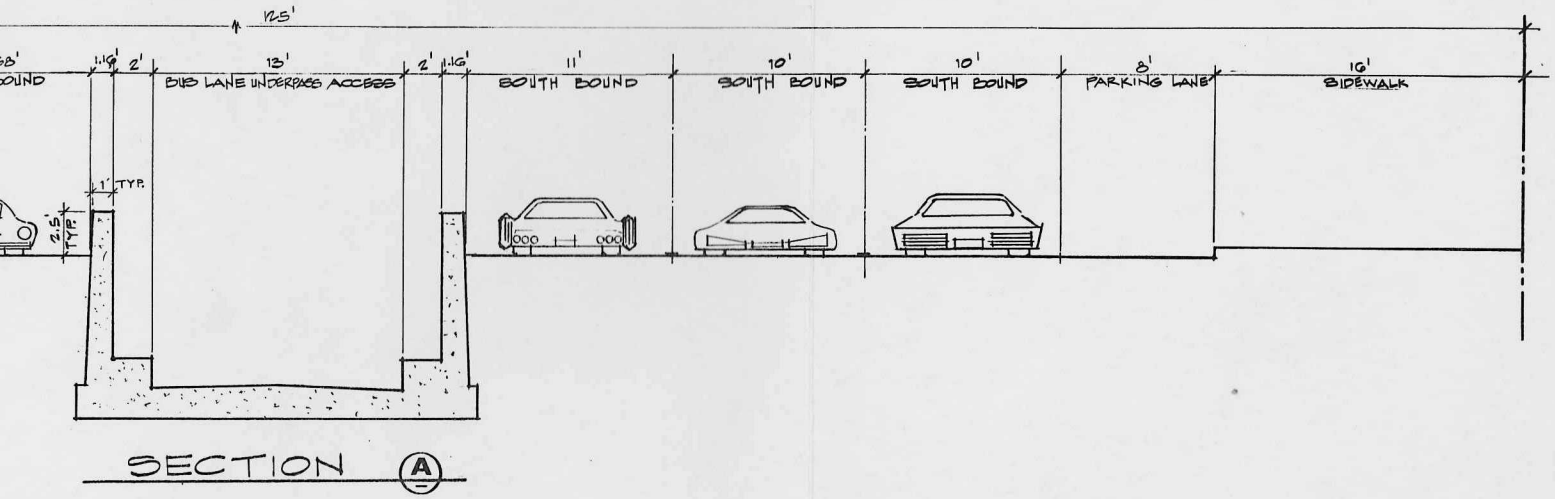
KAISER ENGINEERS



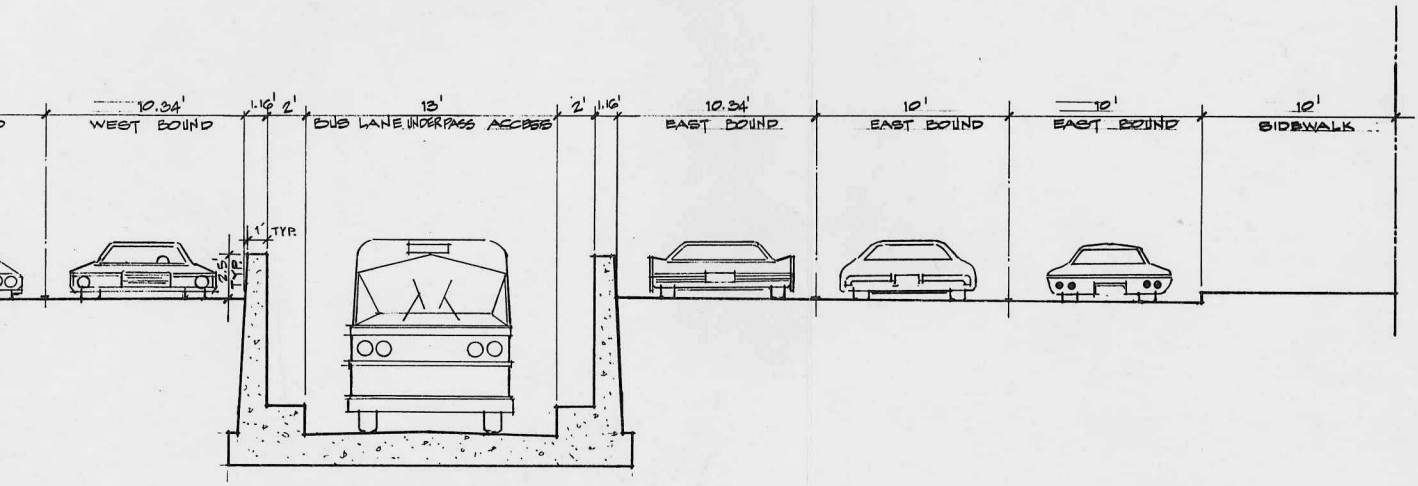
NORTH POINT STREET REVERSIBLE LANE

FIGURE V - 11


GOUGH ST.
16' SIDEWALK
8' PARKING LANE
12' NORTH BOUND
14.0
NORTH B
BUSES ONLY
10' SIDEWALK
10' WEST BOUND
10' WEST BOUND
FRANKLIN ST.
NEW BROKEN WHITE 7" STRIPE (9' LONG, 15' CLEAR)
NEW SOLID WHITE 9" STRIPE
LOMBARD ST.
10' SIDEWALK
10' LANE
10' LANE
10.34' LANE
10.34' LANE
10' LANE
10' SIDEWALK
100'
100' R
CHESTNUT ST.
CUT & COVER
BOX SECTION
VAN NESS A



SECTION (A)



SECTION (B)

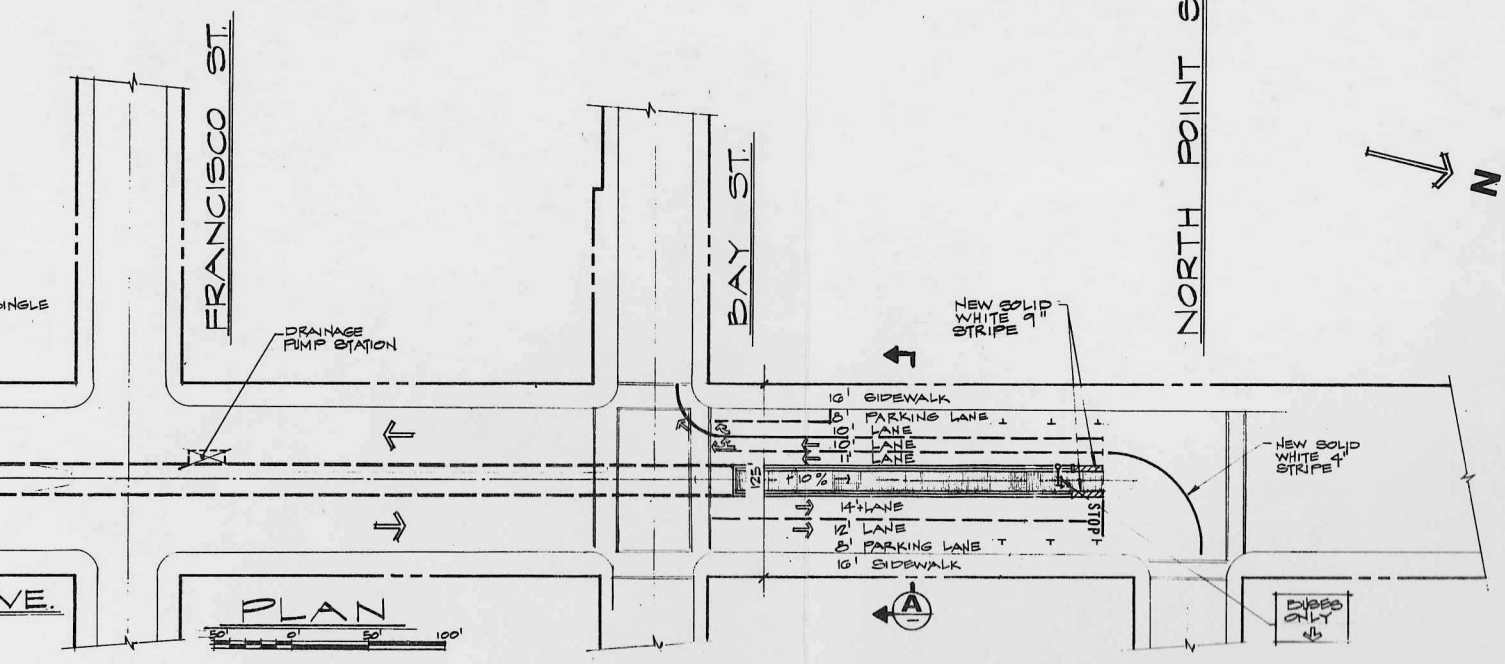


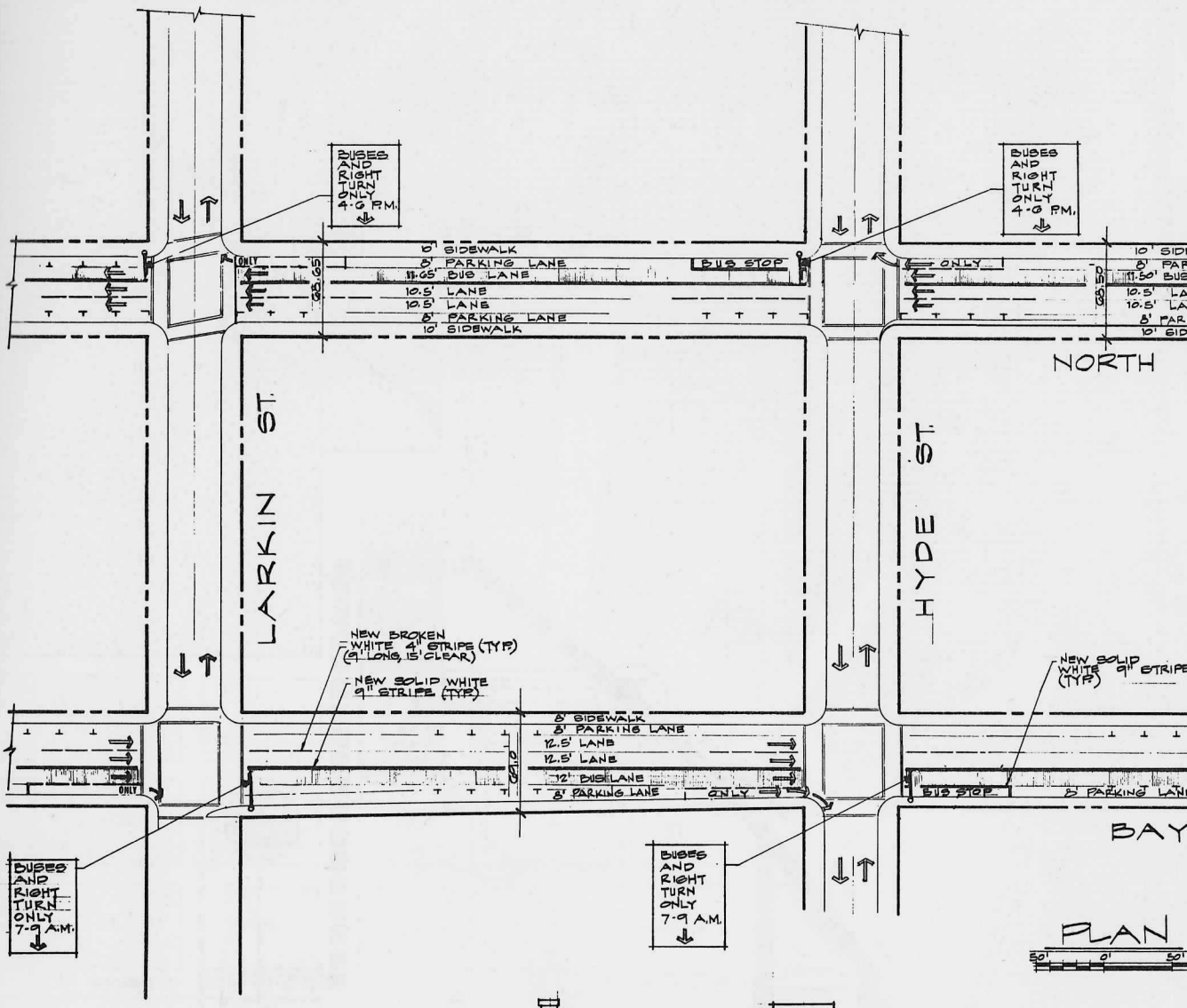
FIGURE V-12

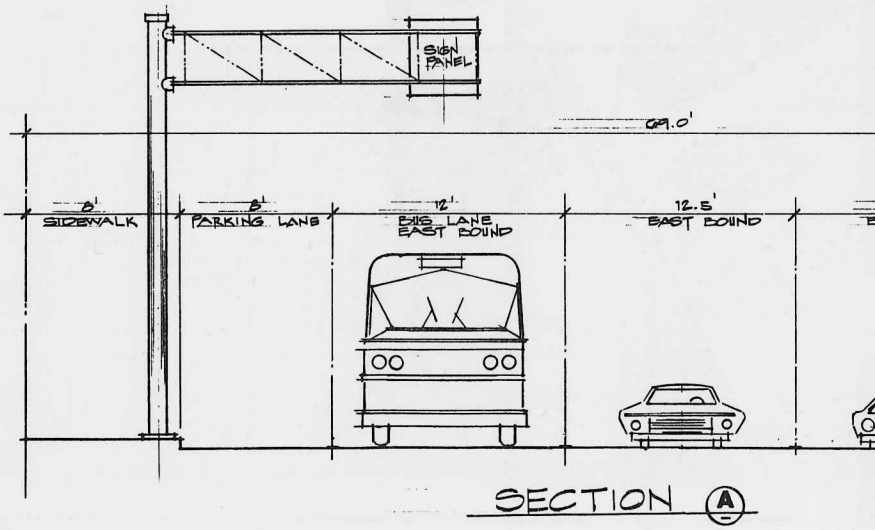
LOMBARD/VAN NESS UNDERPASS

KAISER ENGINEERS

NORTH POINT / BAY ONE WAY COUPLE - BAY STREET

FIGURE V - 13


BUSES AND RIGHT TURN ONLY 4-6 P.M.
BUSES AND RIGHT TURN ONLY 4-6 P.M.
8' SIDEWALK
8' PARKING LANE
11.05' BUS LANE
10.5' LANE
10.5' LANE
8' PARKING LANE
10' SIDEWALK
BUS STOP
ONLY
69.05'
LARKIN ST.
HYDE ST.
NORTH
NEW BROKEN WHITE 4" STRIPE (TYP.) (9' LONG, 15' CLEAR)
NEW SOLID WHITE 9" STRIPE (TYP.)
8' SIDEWALK
8' PARKING LANE
12.5' LANE
12.5' LANE
12' BUS LANE
8' PARKING LANE
ONLY
69.0'
BUS STOP
8' PARKING LANE
NEW SOLID WHITE 9" STRIPE (TYP.)
BAY
BUSES AND RIGHT TURN ONLY 7-9 A.M.
BUSES AND RIGHT TURN ONLY 7-9 A.M.
PLAN
50' 0' 50'


SIGN PANEL
69.0'
8' SIDEWALK
8' PARKING LANE
12' BUS LANE EAST BOUND
12.5' EAST BOUND

SECTION (A)

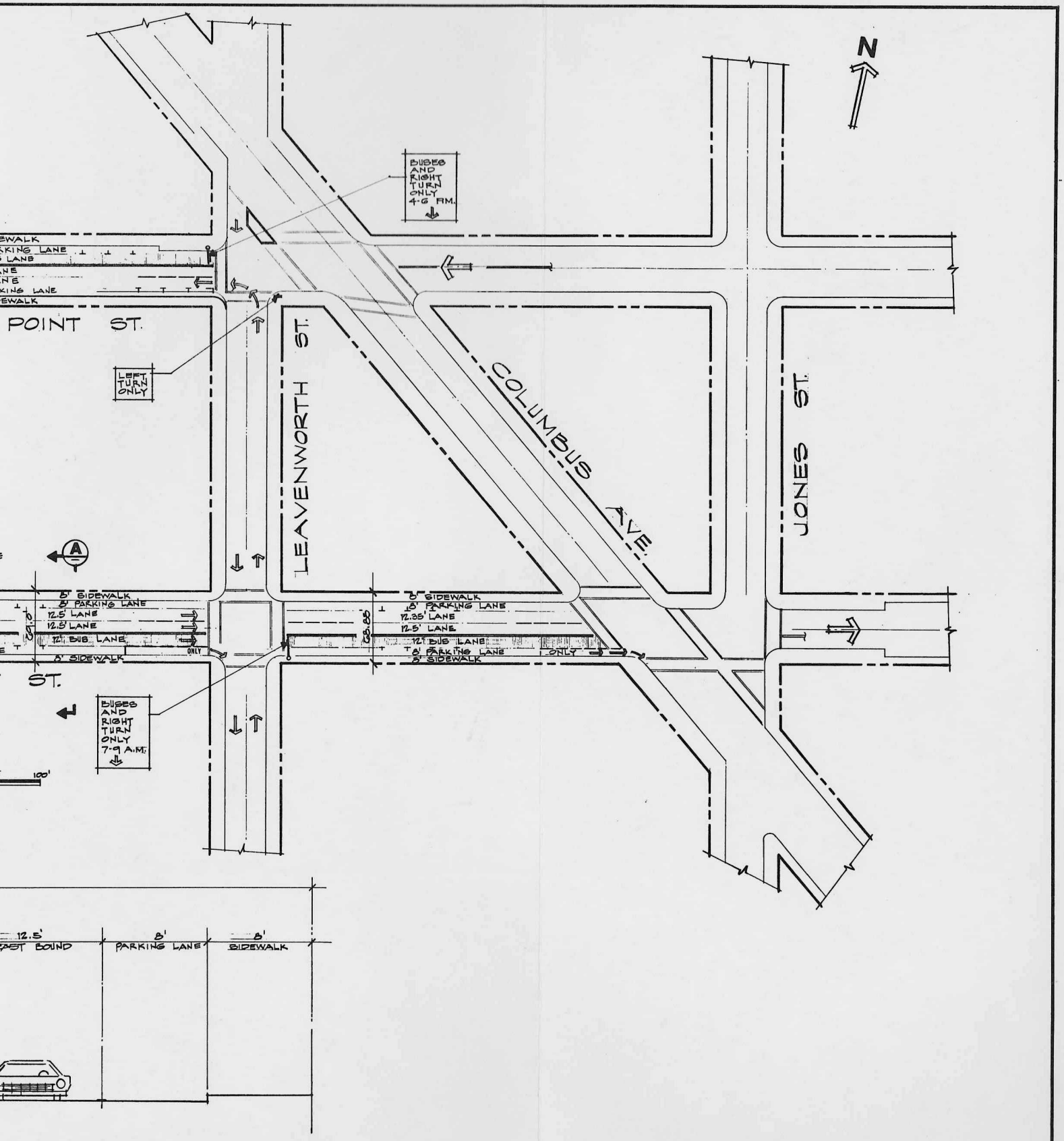
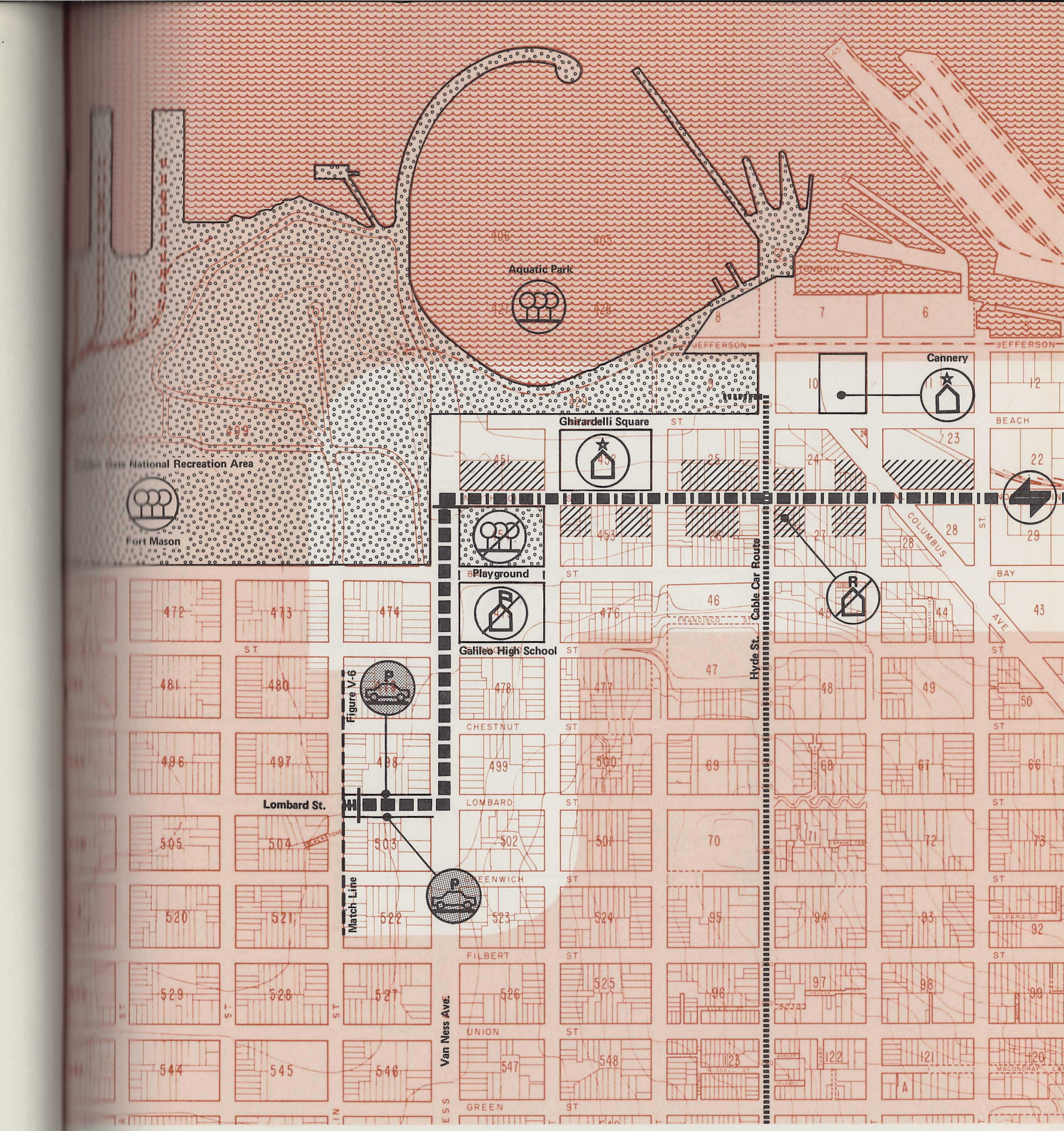


FIGURE V-14

NORTH POINT/BAY ONE-WAY COUPLE WITH RESERVED LANES

KAISER ENGINEERS



Hospital

Open Space

Structure

Schools/Colleges

Residential Noise Impact Potential

Noise Impact Potential

Historic Landmark

Landmark

Displaced Activity

Parking

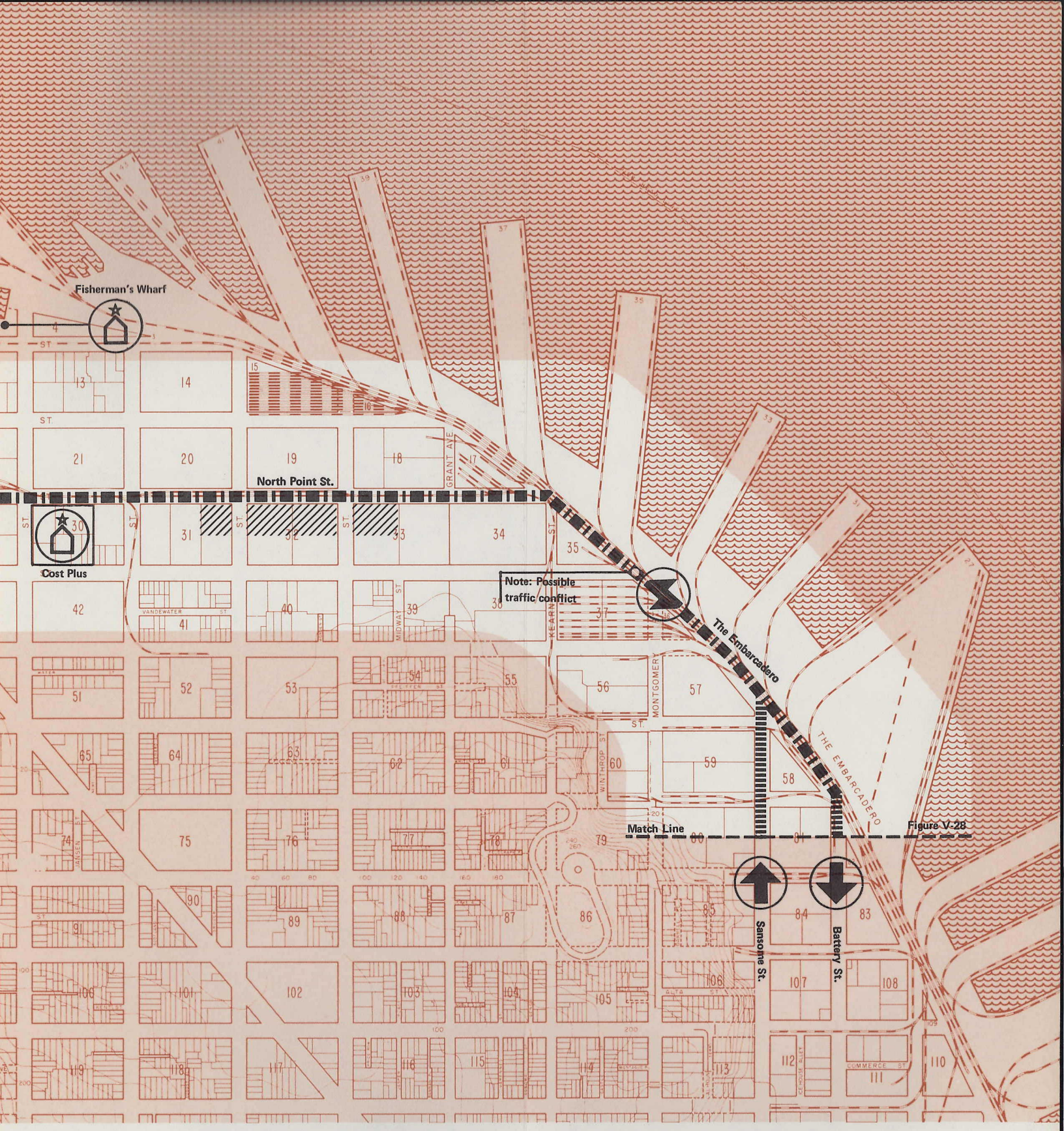
Demand Stop

Business/ Employment

Elevator

Underground R.O.W. Easement

Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

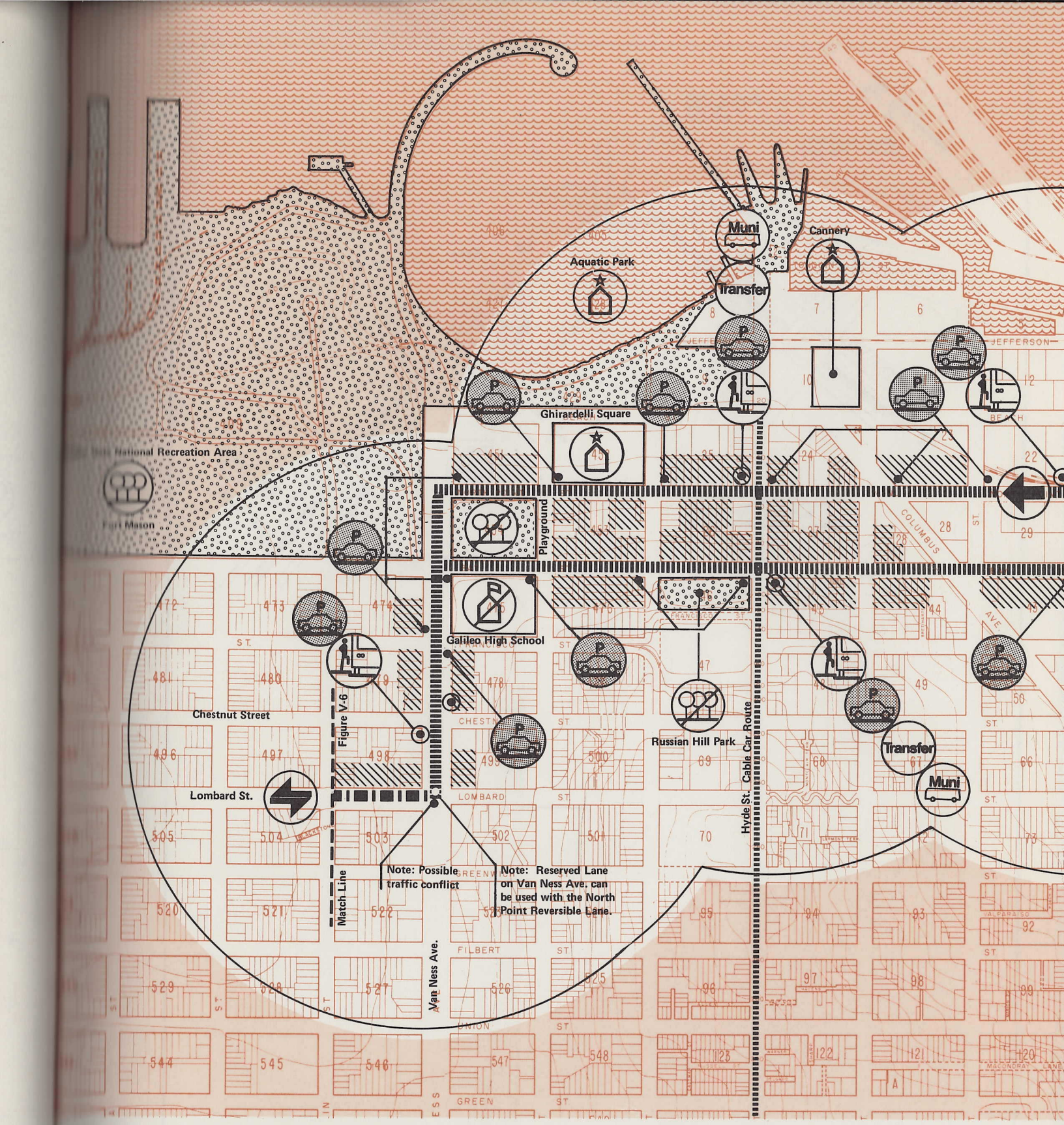
5 Min. Walk To Station

R = 1320'

NORTH POINT STREET REVERSIBLE LANE

(IMPACT MAP)

FIGURE V-15



Hospital

Open Space

Structure

Schools/Colleges

Residential Noise Impact Potential

Noise Impact Potential

Historic Landmark

Landmark

Displaced Activity

Parking

Demand Stop

Business/ Employment

Elevator

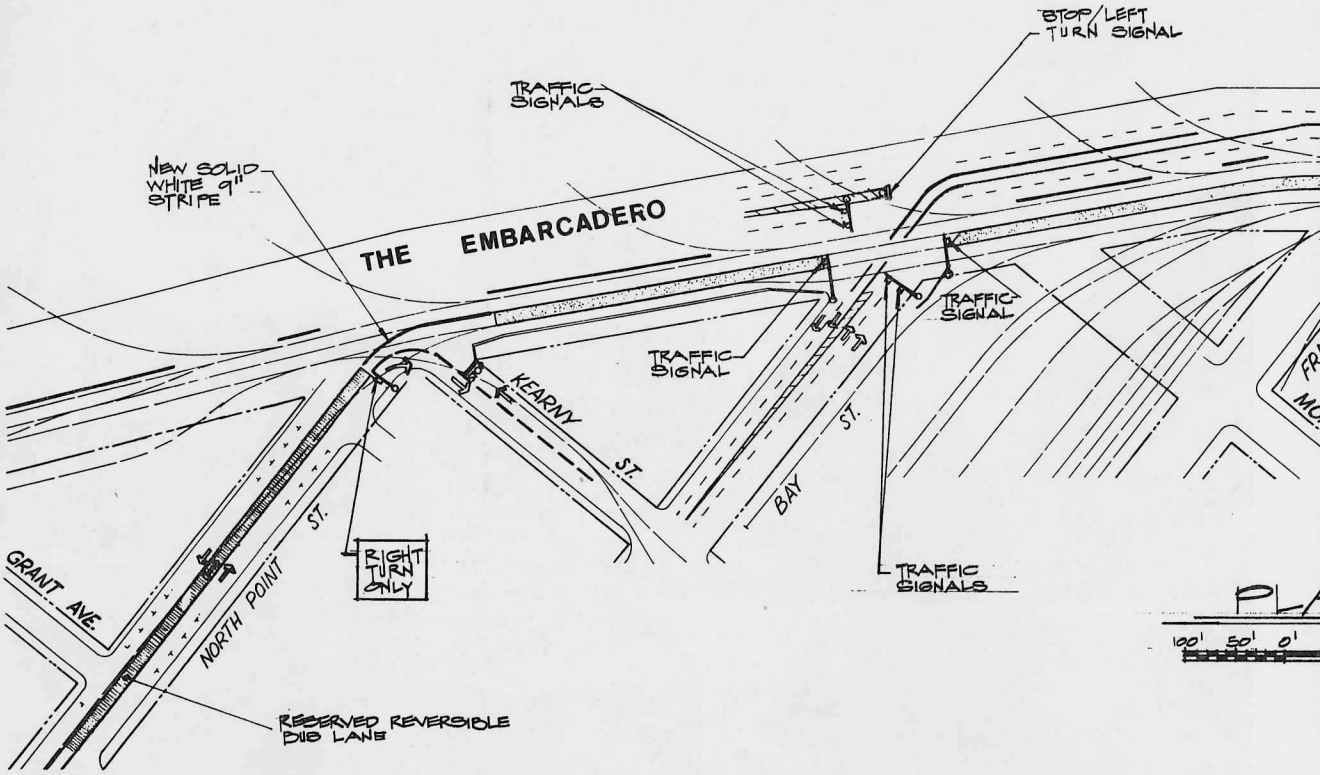
Underground R.O.W. Easement

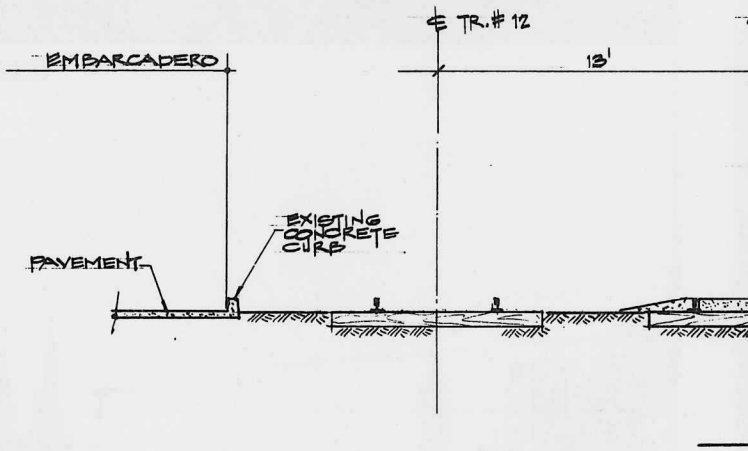
Access to Station

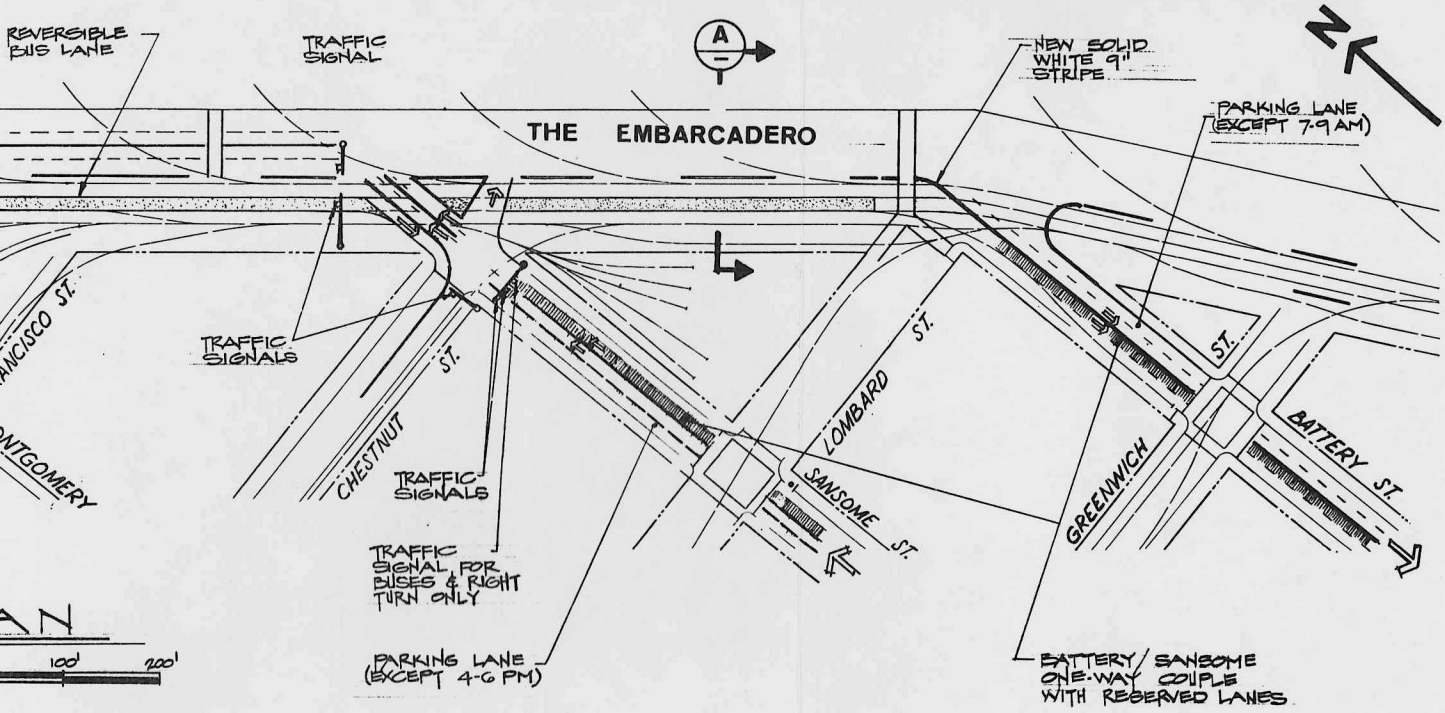
NORTH POINT/BAY ONE-WAY COUPLE

(IMPACT MAP)

FIGURE V - 16


STOP/LEFT TURN SIGNAL
TRAFFIC SIGNALS
NEW SOLID WHITE 9" STRIPE
THE EMBARCADERO
TRAFFIC SIGNAL
TRAFFIC SIGNAL
KEARNY ST.
BAY ST.
GRANT AVE.
NORTH POINT ST.
RIGHT TURN ONLY
TRAFFIC SIGNALS
RESERVED REVERSIBLE BUS LANE
100' 50' 0'


℄ TR. # 12
EMBARCADERO
13'
EXISTING CONCRETE CURB
PAVEMENT



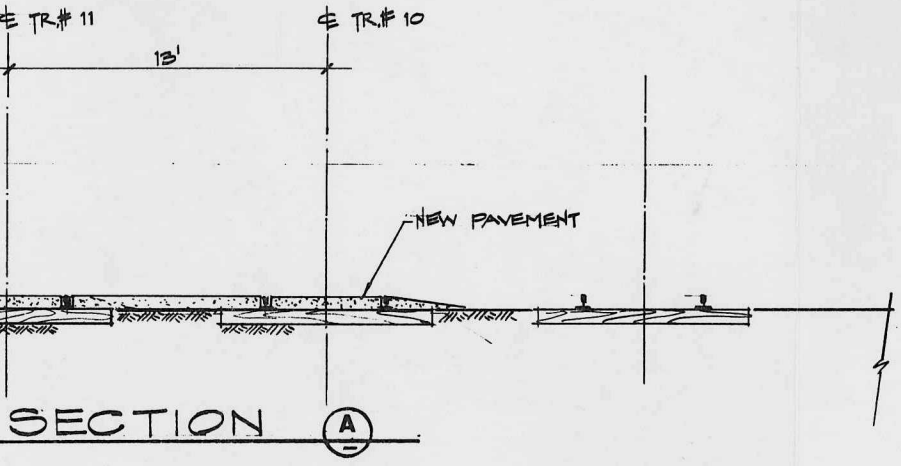
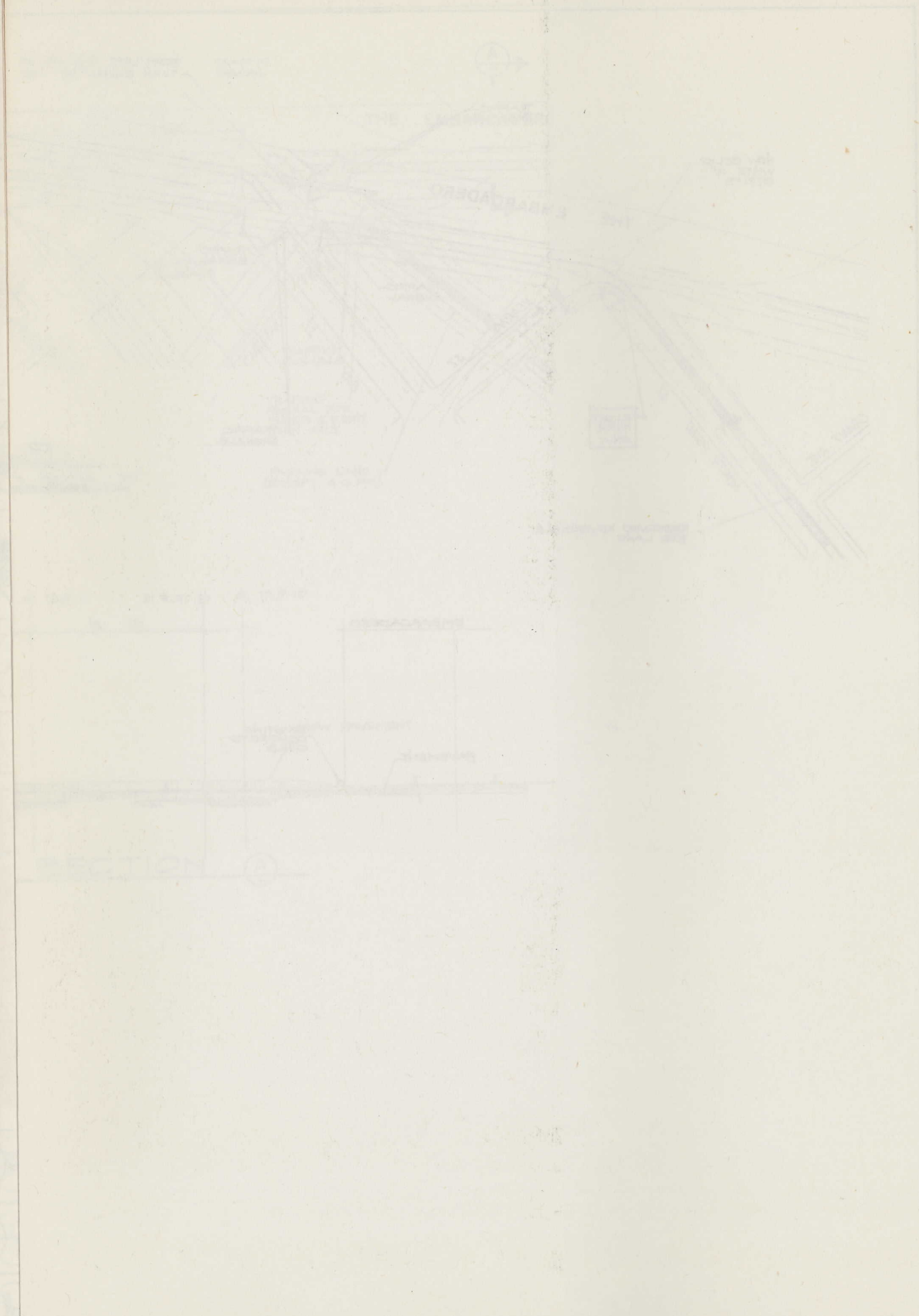
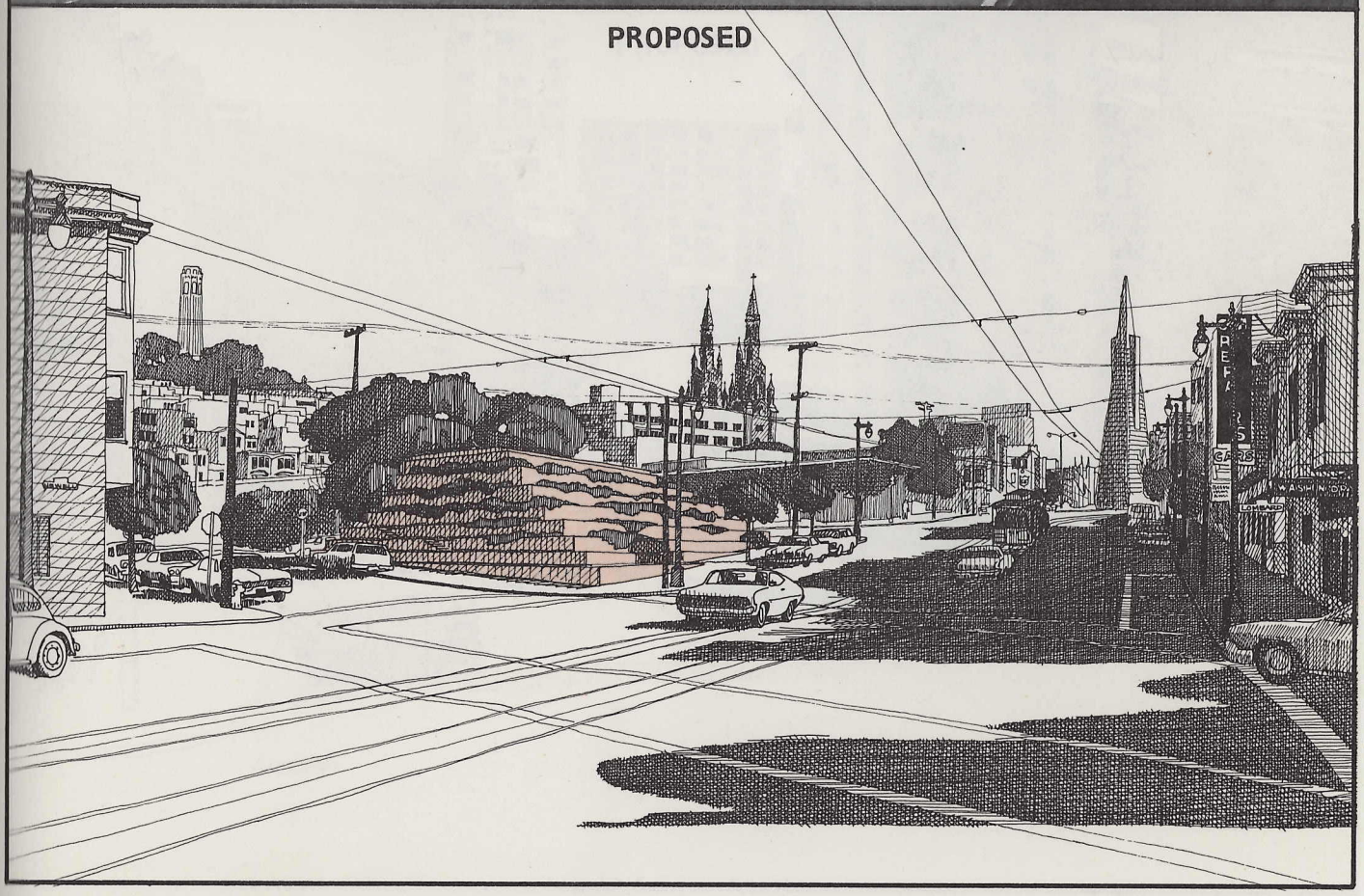


FIGURE V-17

THE EMBARCADERO REVERSIBLE LANE

KAISER ENGINEERS





TUNNEL VENT STRUCTURE AT LOMBARD AND COLUMBUS

FIGURE V - 18A

TUNNEL VENT STRUCTURE AT LOMBARD AND COLUMBUS

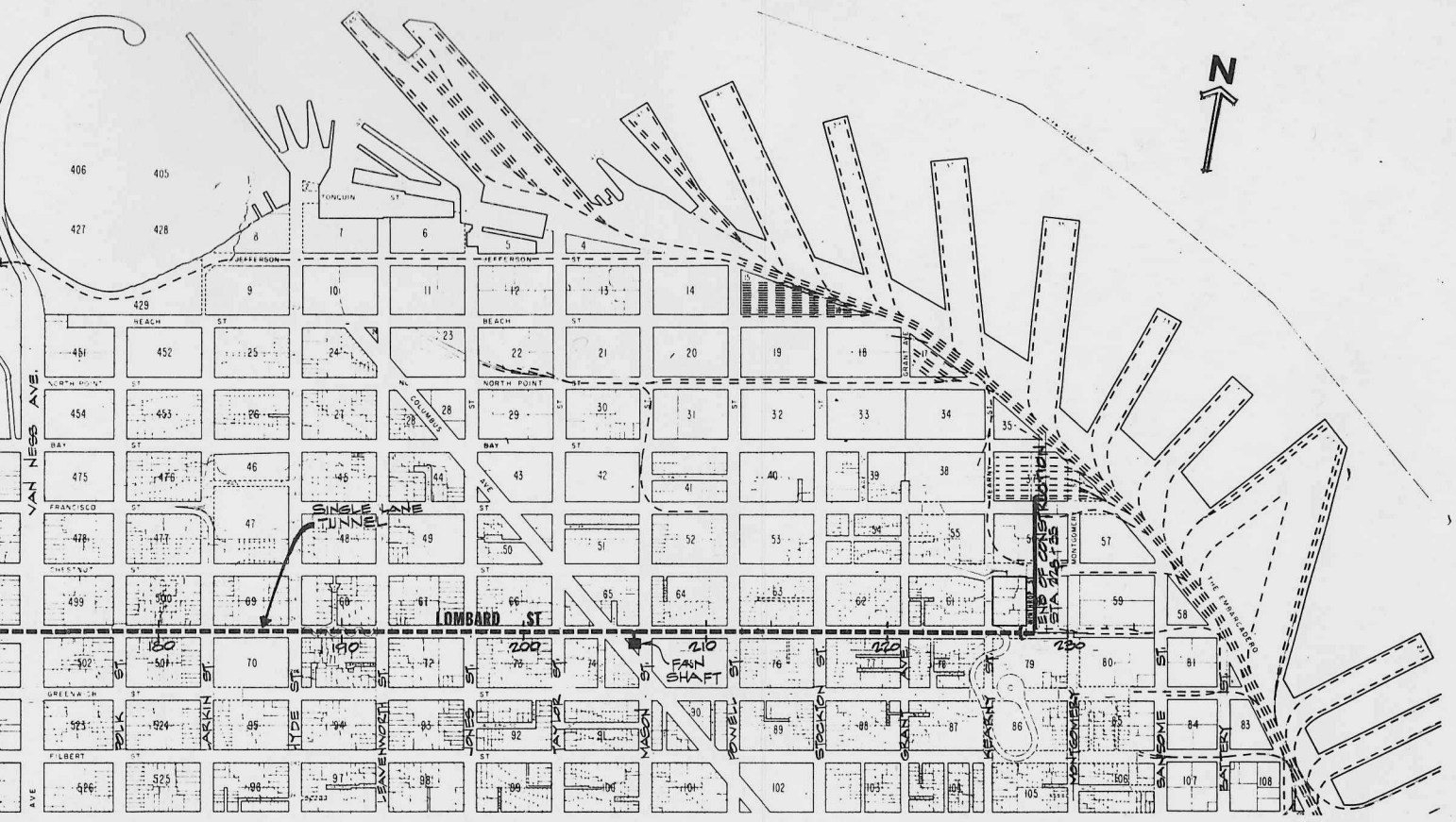
FIGURE V - 13A

**LOMBARD SINGLE LANE TUNNEL,
EASTERN PORTAL AT WINTHROP**

FIGURE V - 18B

NOTES

1. ELEVATIONS ARE BASED ON CITY OF SAN FRANCISCO DATUM = ELEVATION 8.62' ABOVE U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929.
2. FOR TYPICAL SECTIONS SEE FIG. V-35



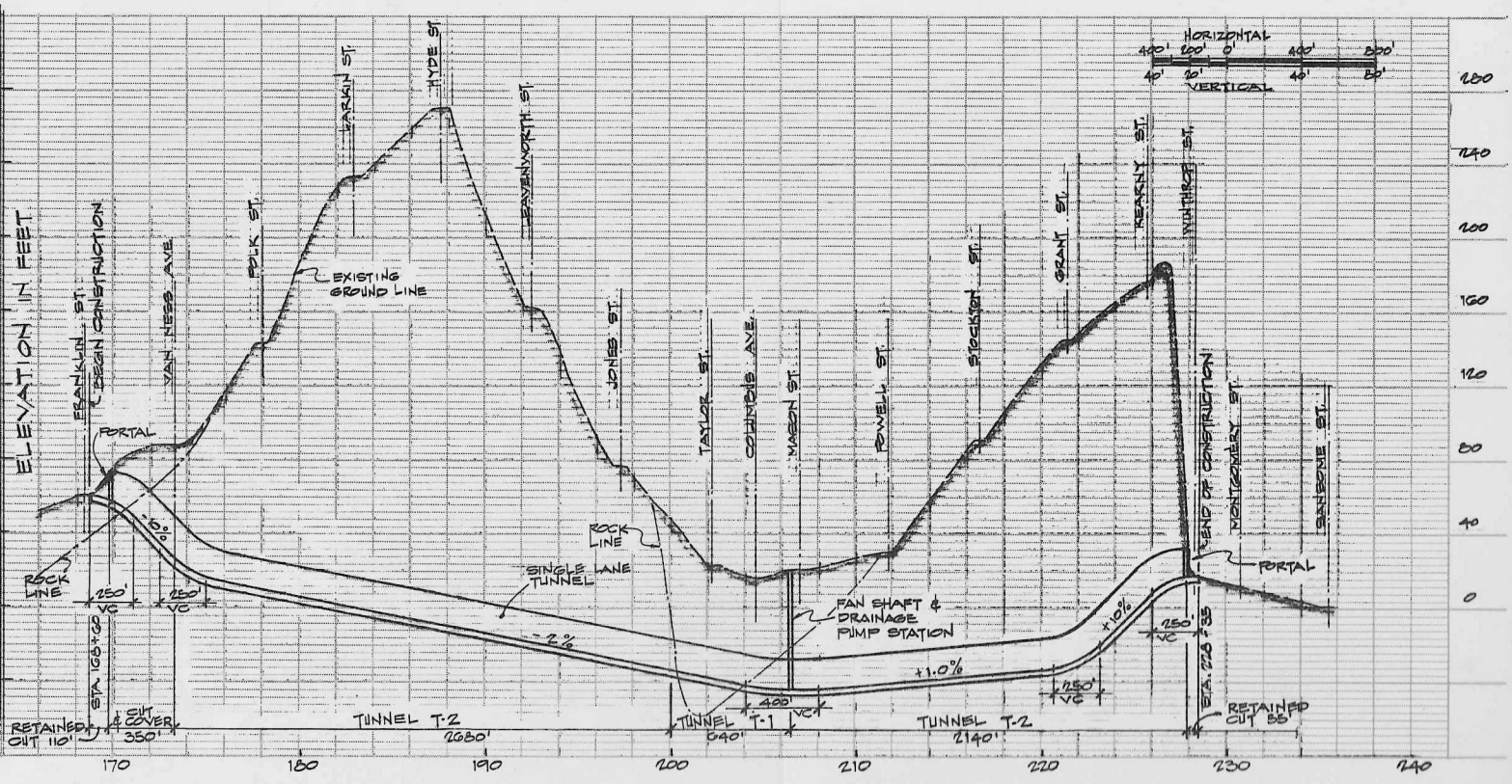
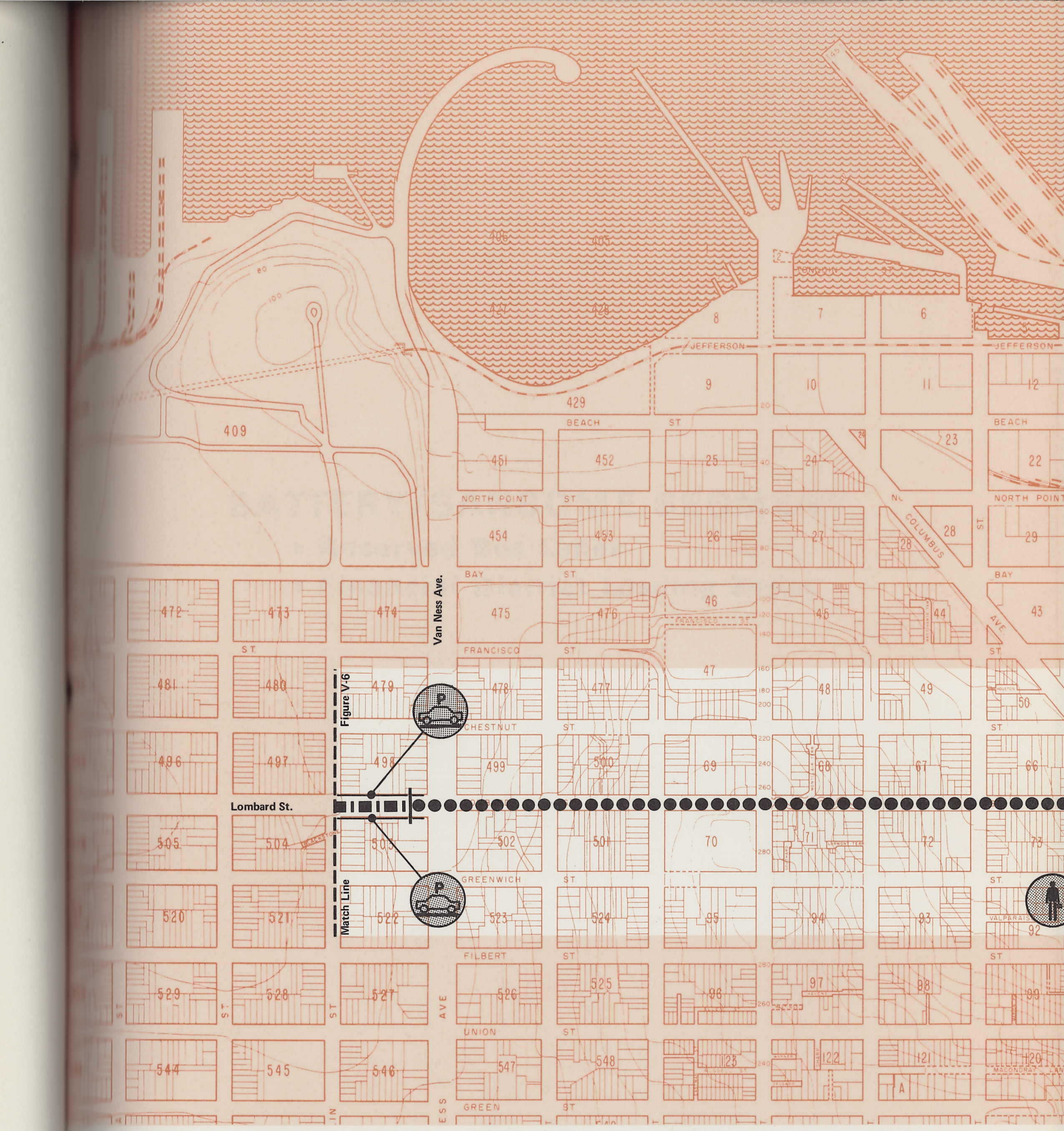


FIGURE V-19

LOMBARD SINGLE LANE TUNNEL

KAISER ENGINEERS



Hospital

Schools/Colleges

Historic Landmark

Parking

Elevator

Open Space

Residential Noise Impact Potential

Landmark

Demand Stop

Underground R.O.W. Easement

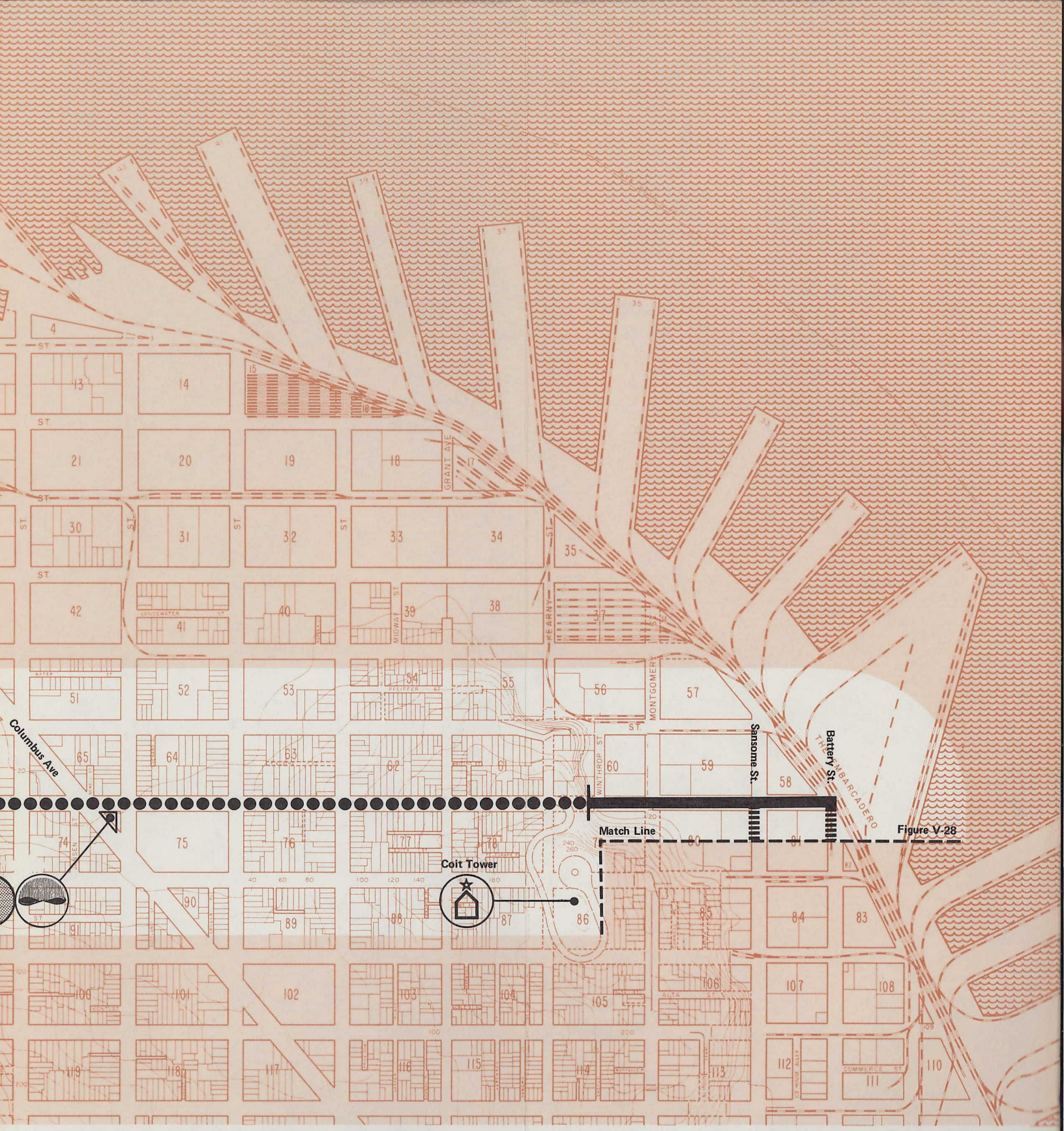
Structure

Noise Impact Potential

Displaced Activity

Business/ Employment

Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

5 Min. Walk To Station

R = 1320'

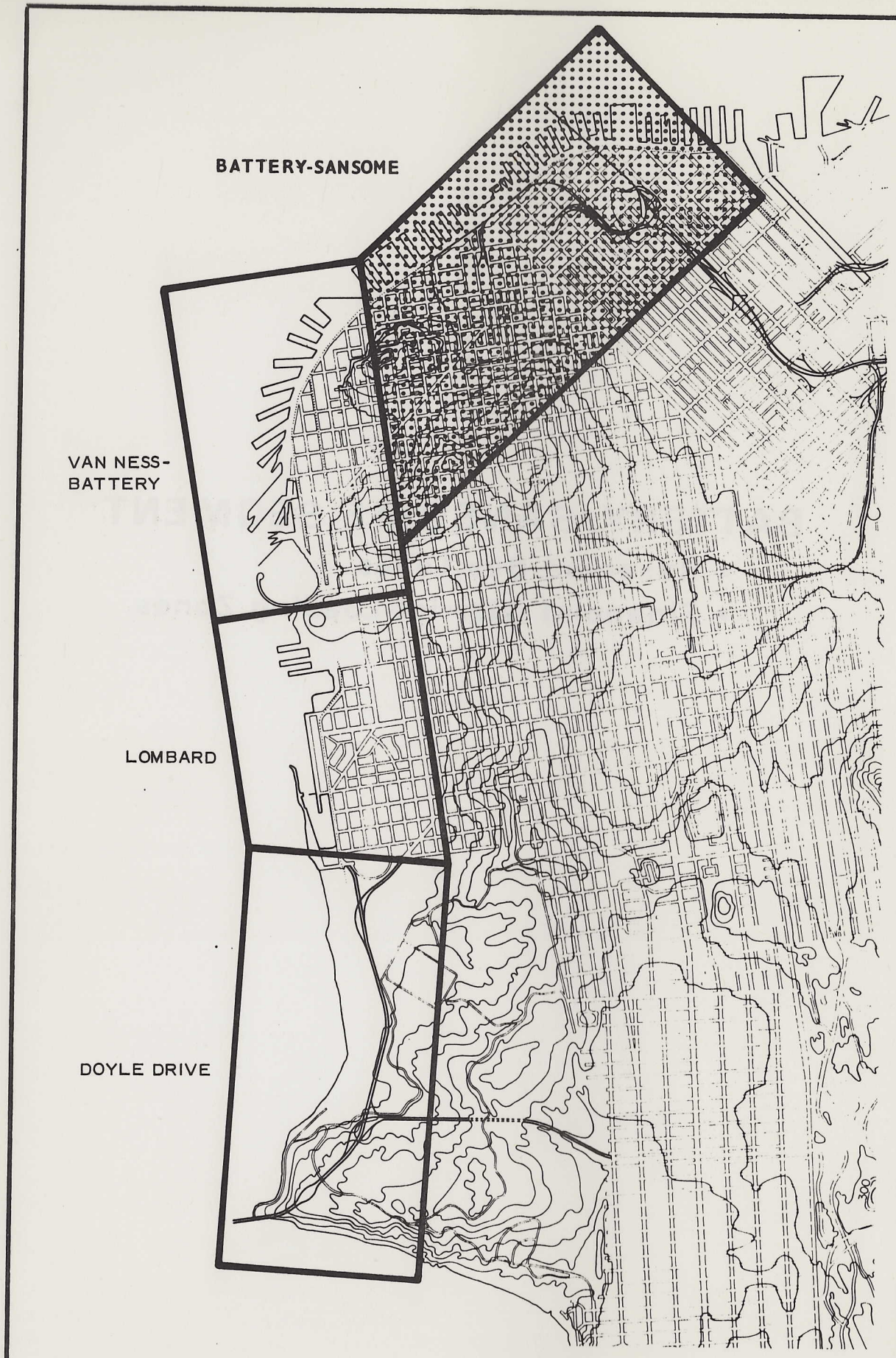
LOMBARD SINGLE LANE TUNNEL

(IMPACT MAP)

FIGURE V - 20

BATTERY/SANSOME SEGMENT

- Reserved Bus Lanes
- Financial District Loading Zones


BATTERY-SANSOME
VAN NESS-
BATTERY
LOMBARD
DOYLE DRIVE

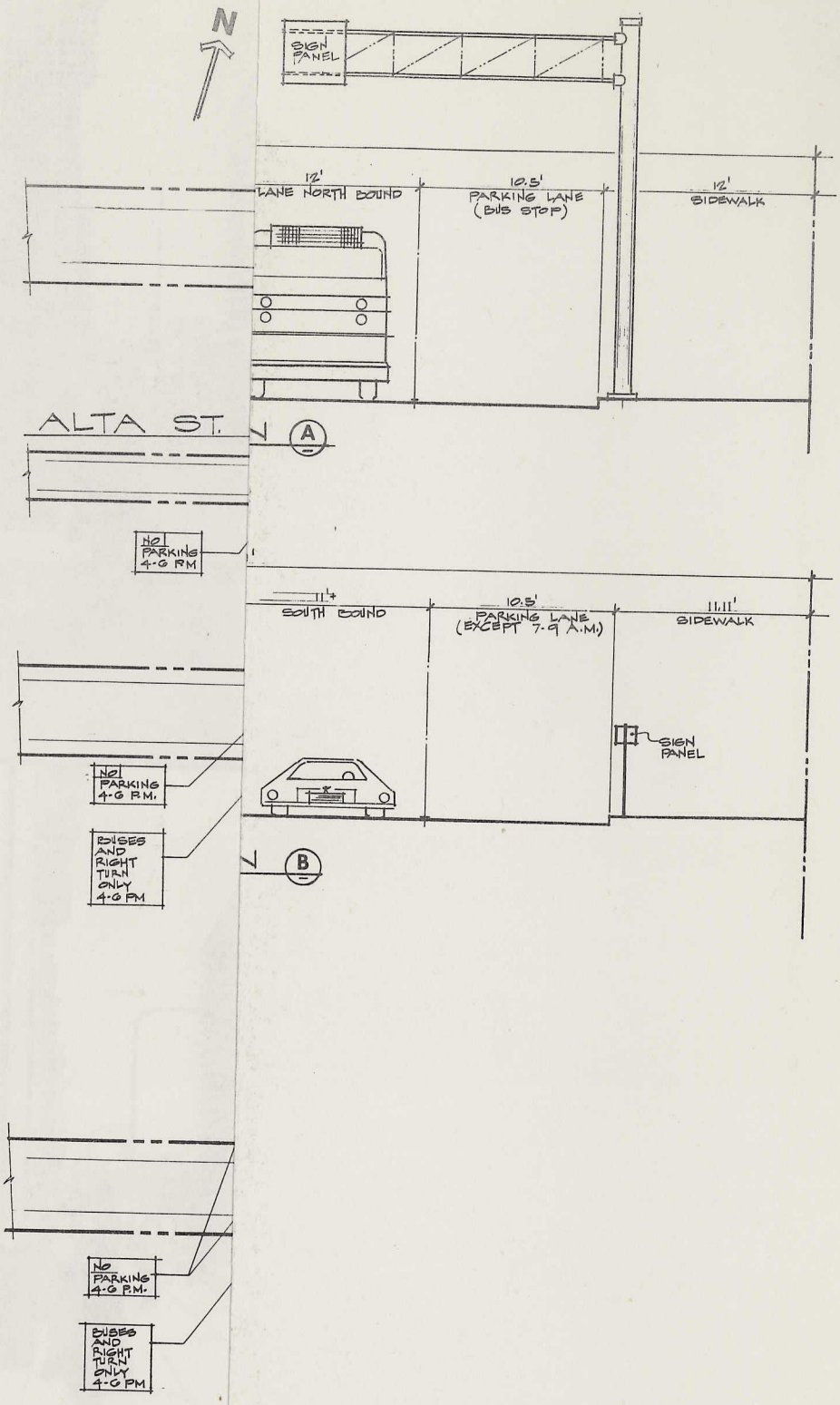
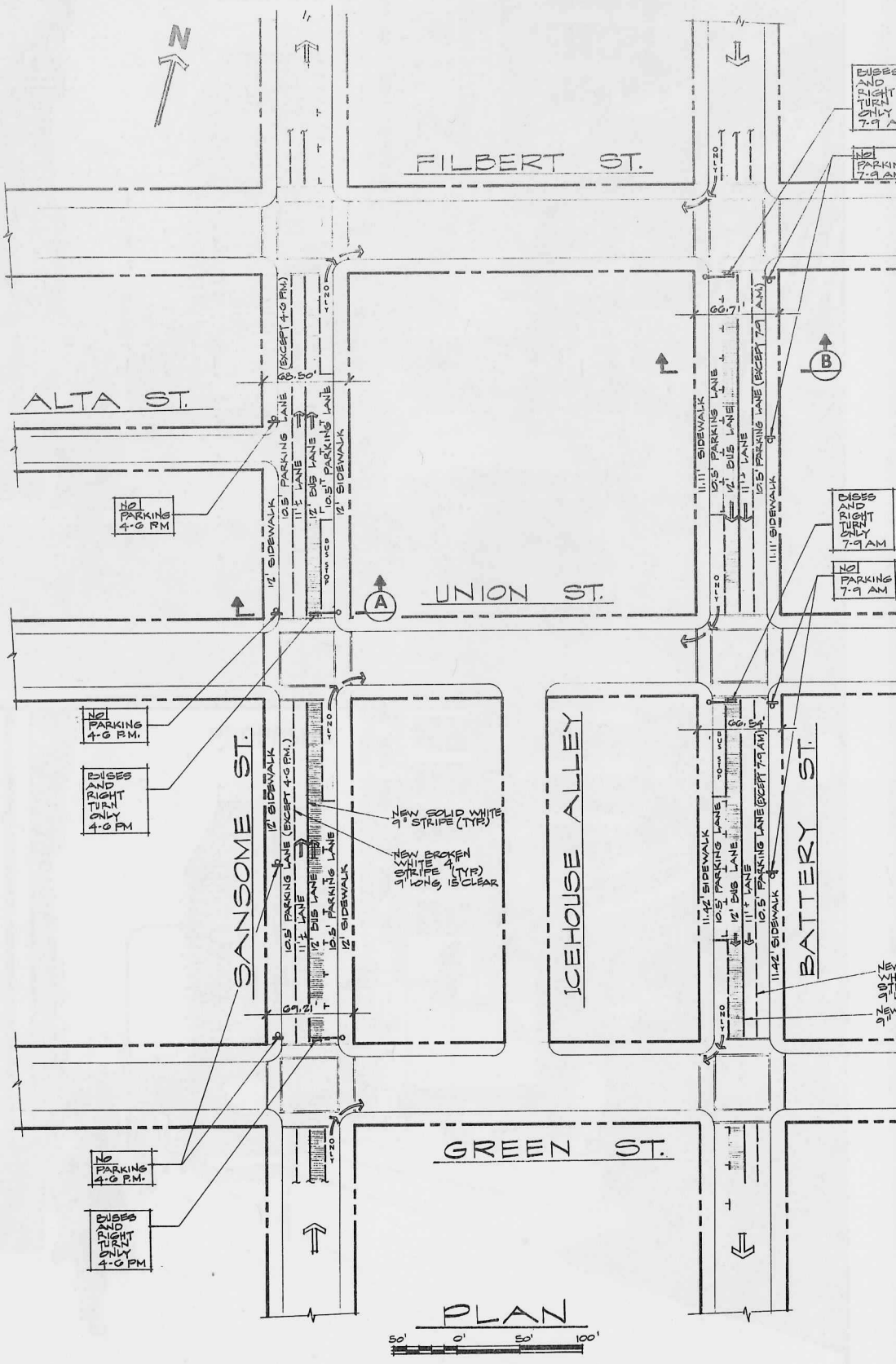


FIGURE V-21

BATTERY/SANSOME ONE-WAY COUPLE WITH RESERVED LANES

KAISER ENGINEERS


N
FILBERT ST.
ALTA ST.
UNION ST.
SANSOME ST.
ICEHOUSE ALLEY
BATTERY ST.
GREEN ST.
NO PARKING 4-6 PM
BUSES AND RIGHT TURN ONLY 4-6 PM
NO PARKING 7-9 AM
BUSES AND RIGHT TURN ONLY 7-9 AM
NEW SOLID WHITE 9" STRIPE (TYP.)
NEW BROKEN WHITE 4" STRIPE (TYP.) 9' LONG, 15' CLEAR
12' SIDEWALK
10.5' PARKING LANE (EXCEPT 4-6 PM.)
11.5' LANE
12' BUS LANE
10.5' PARKING LANE
11.11' SIDEWALK
10.5' PARKING LANE (EXCEPT 7-9 AM)
11.42' SIDEWALK
69.21'
66.71'
66.50'
66.54'
PLAN
50' 0' 50' 100'

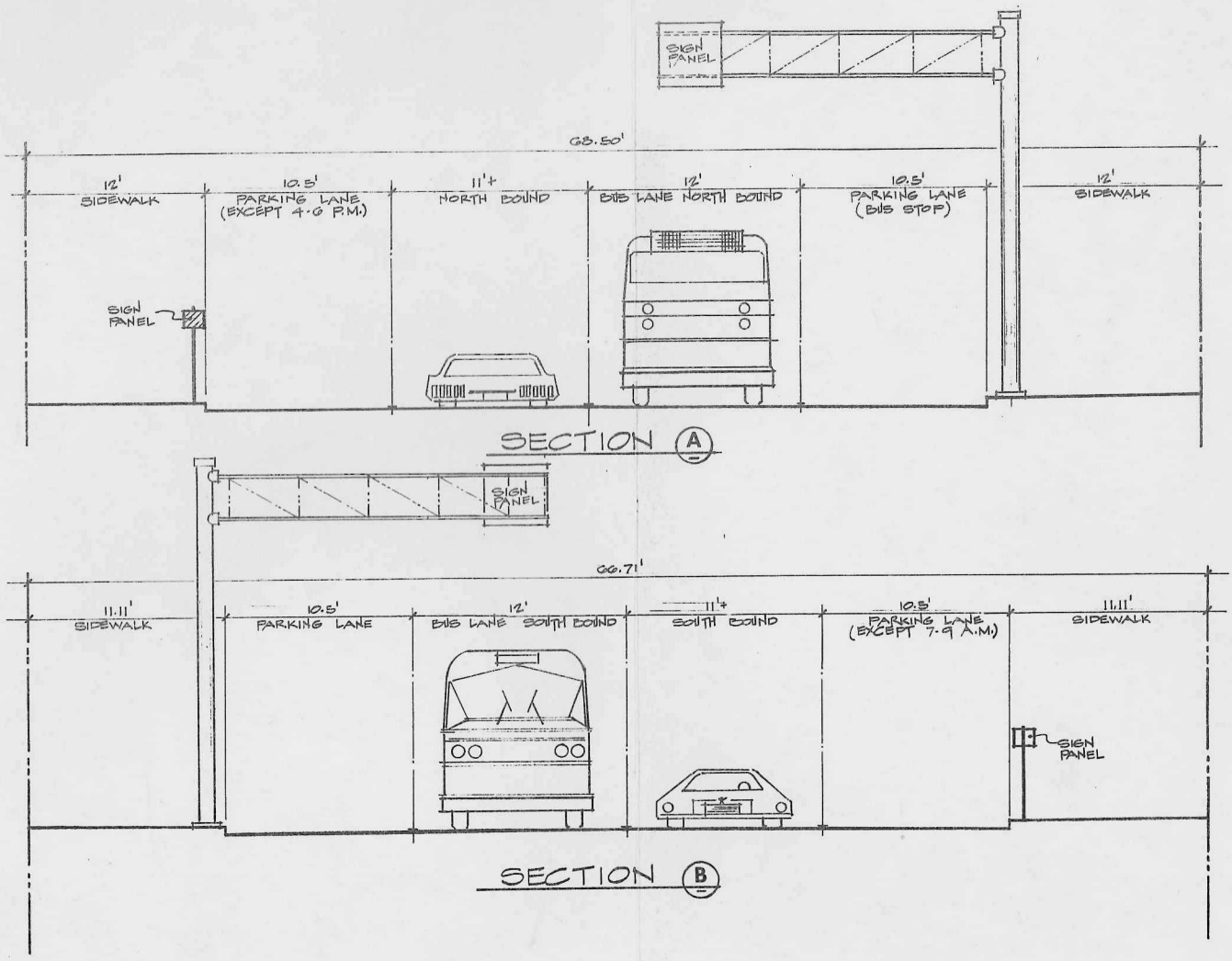
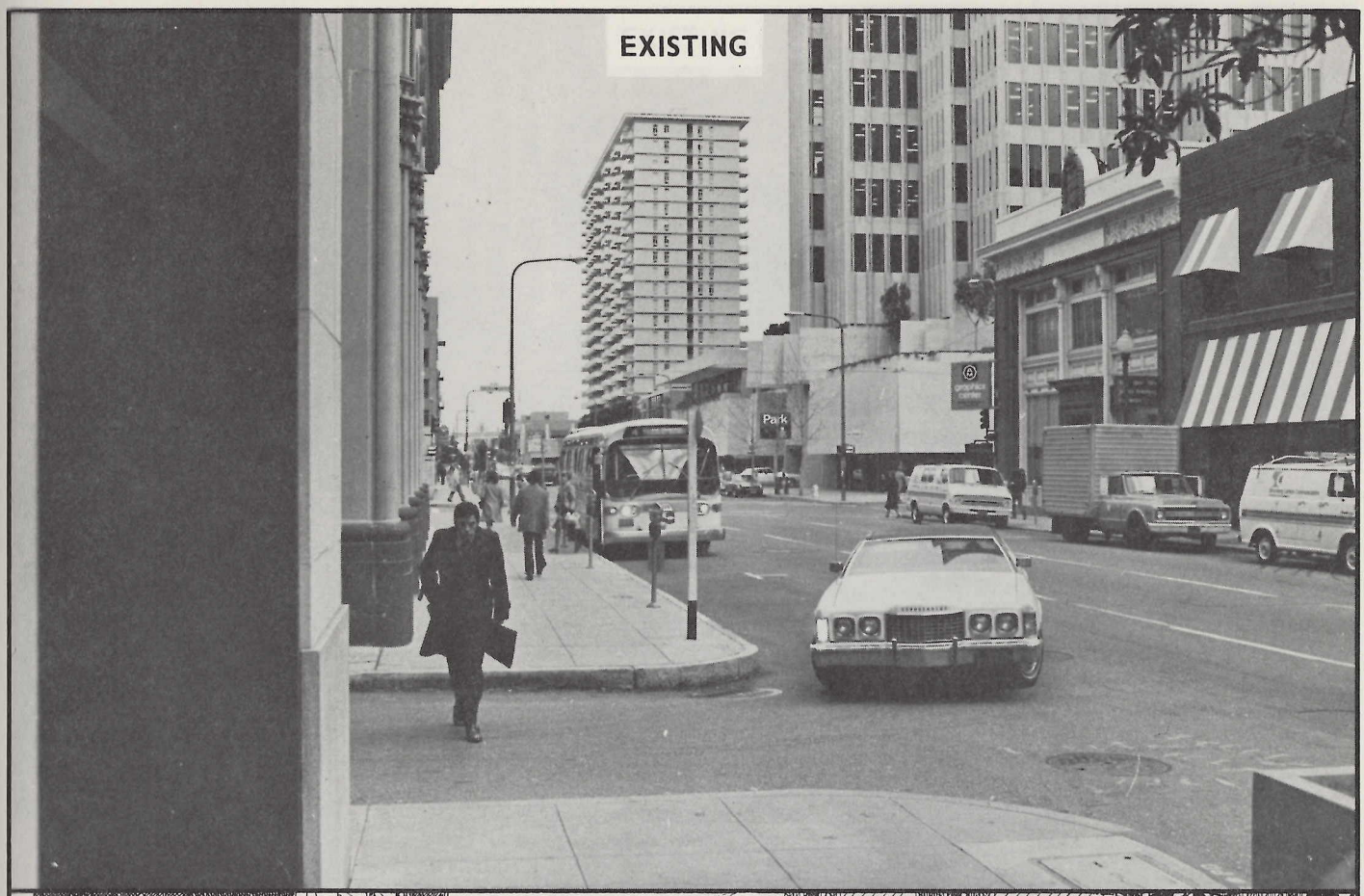


FIGURE V-21

BATTERY/SANSOME ONE-WAY COUPLE WITH RESERVED LANES

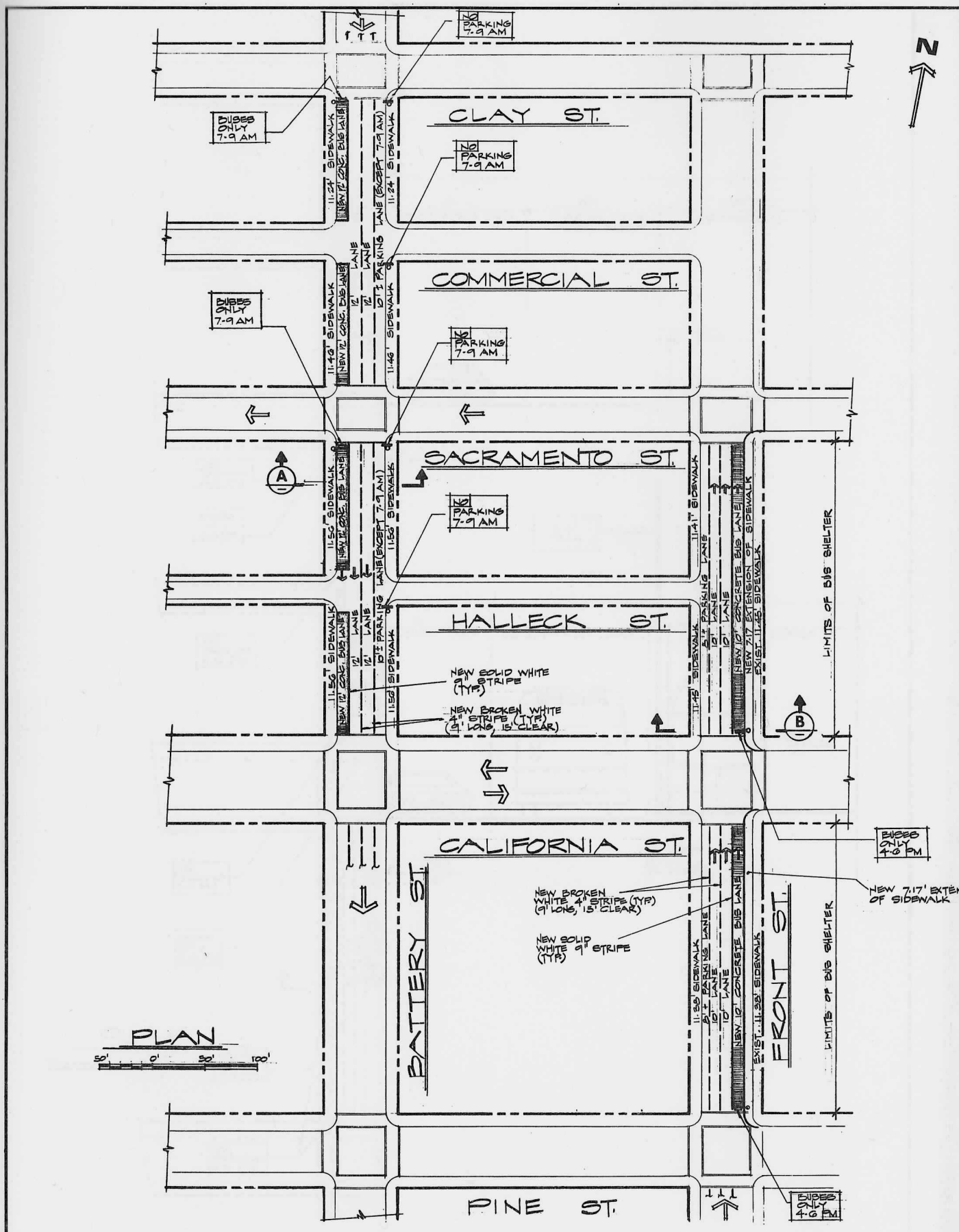
KAISER ENGINEERS

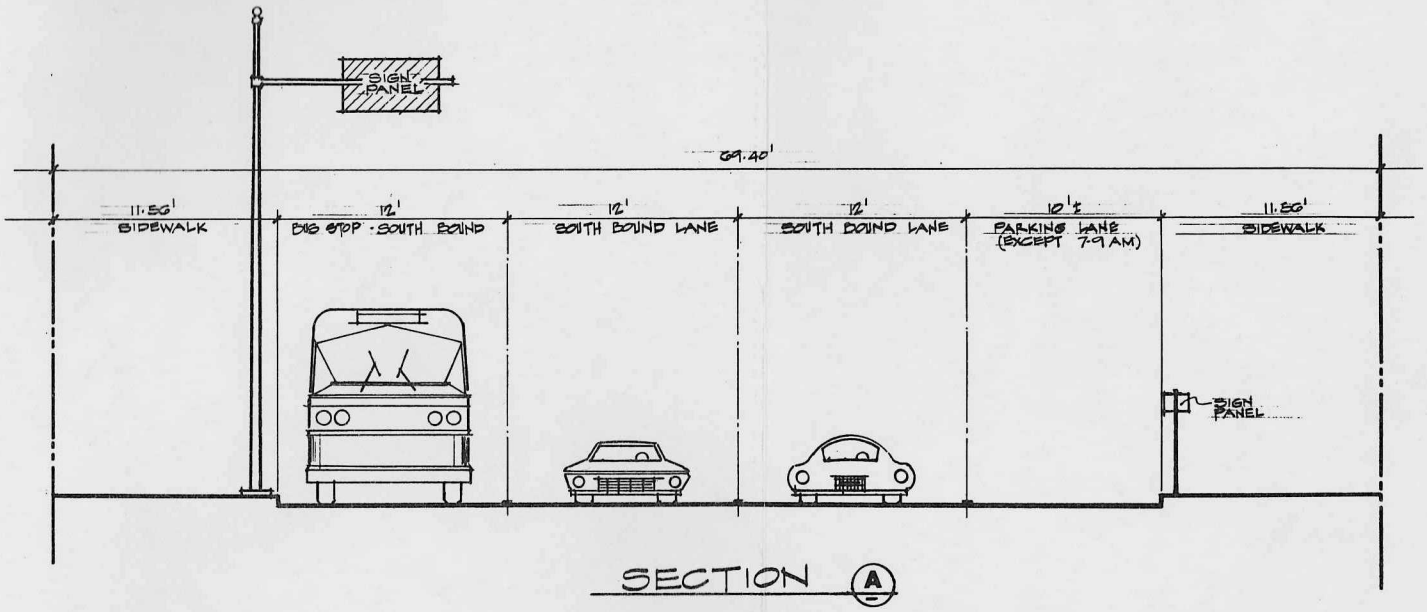


BATTERY STREET
FINANCIAL DISTRICT A.M. LOADING ZONE

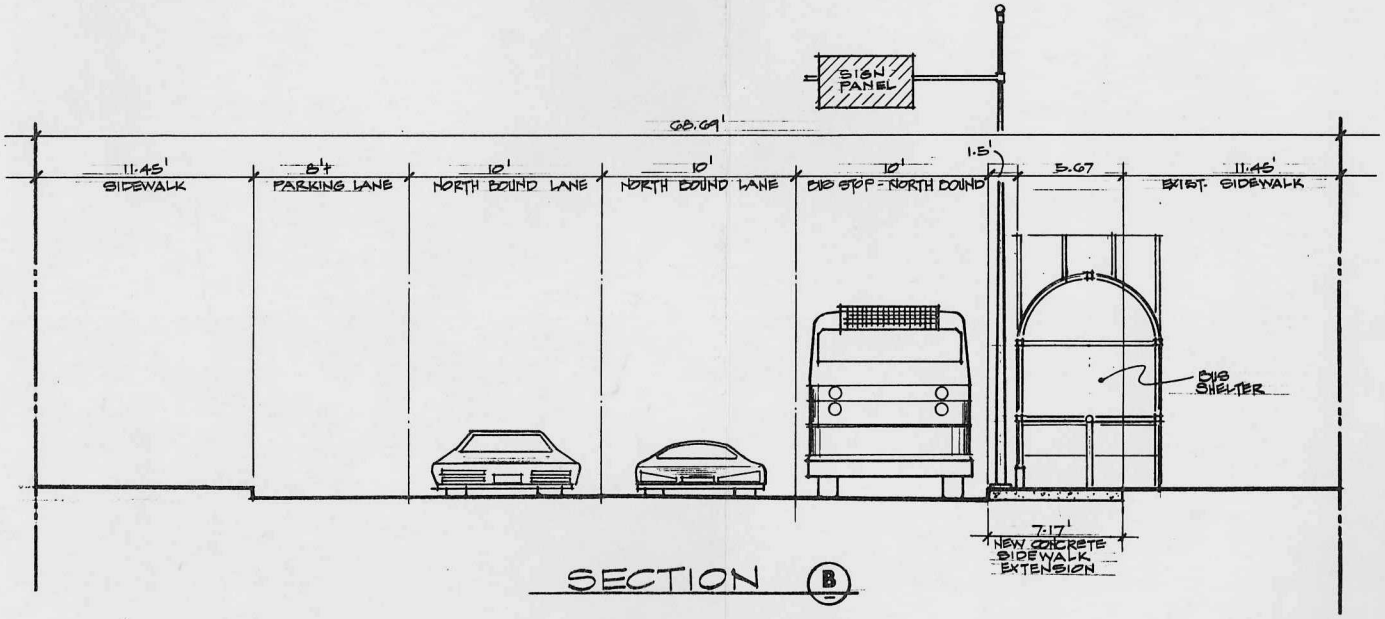
FRONT STREET - FINANCIAL DISTRICT
P.M. LOADING ZONE

FIGURE V - 23


N
CLAY ST.
COMMERCIAL ST.
SACRAMENTO ST.
HALLECK ST.
CALIFORNIA ST.
PINE ST.
BATTERY ST.
FRONT ST.
NO PARKING 7-9 AM
BUSES ONLY 7-9 AM
BUSES ONLY 4-6 PM
NEW SOLID WHITE 9" STRIPE (TYP.)
NEW BROKEN WHITE 4" STRIPE (TYP.) (9' LONG, 15' CLEAR)
NEW 7.17' EXTENSION OF SIDEWALK
LIMITS OF BUS SHELTER
PLAN
50' 0' 50' 100'



SECTION (A)



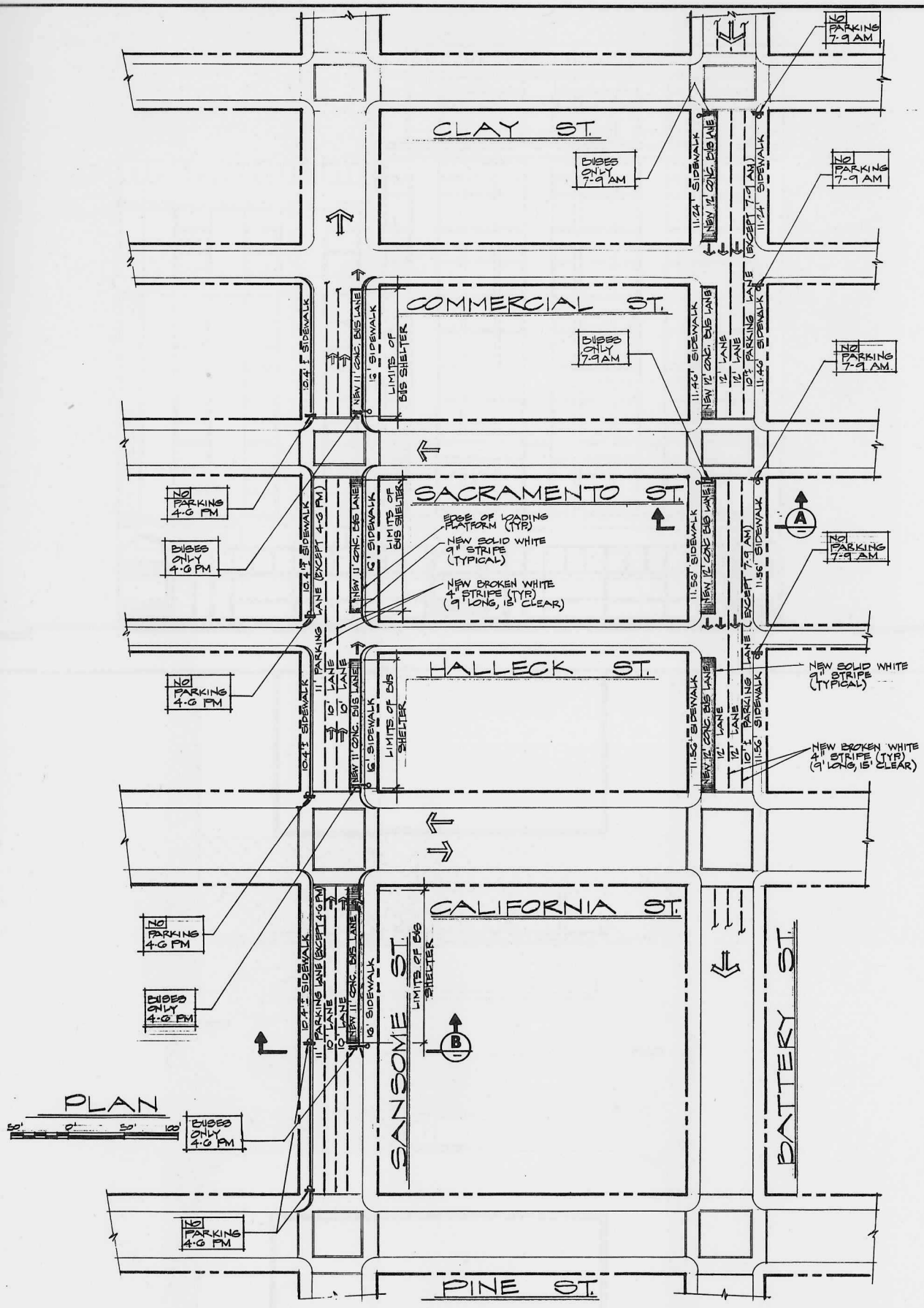
SECTION (B)

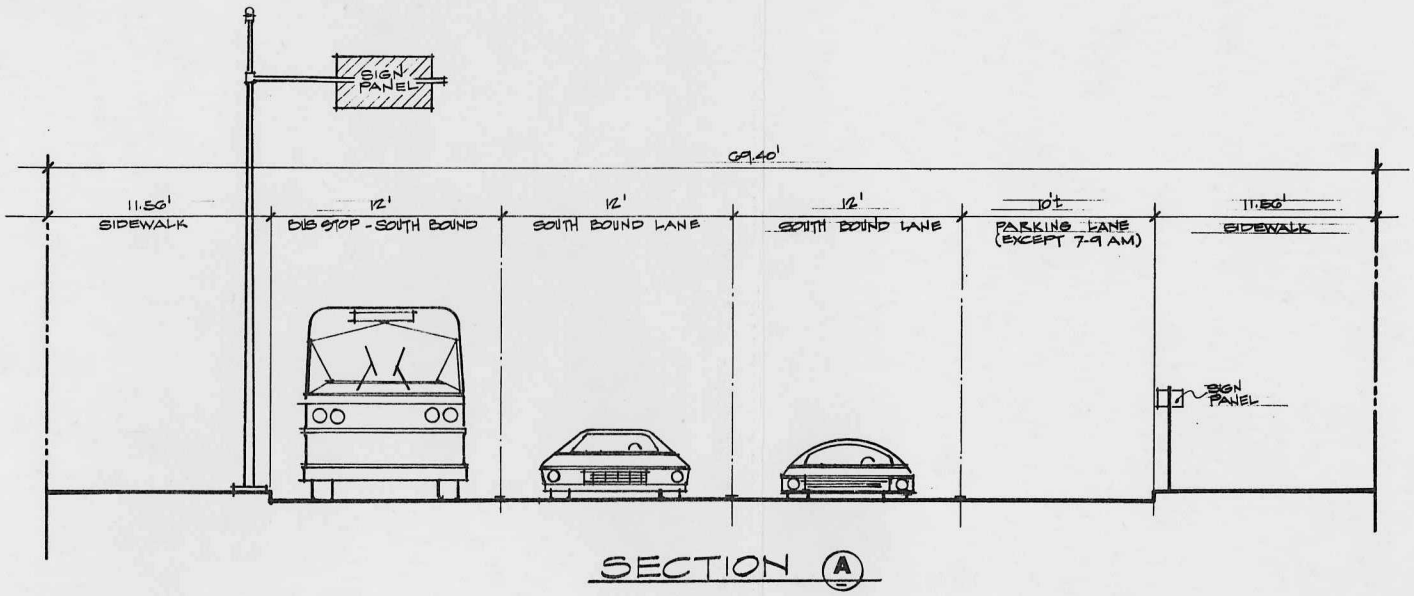
NSION

FIGURE II-24

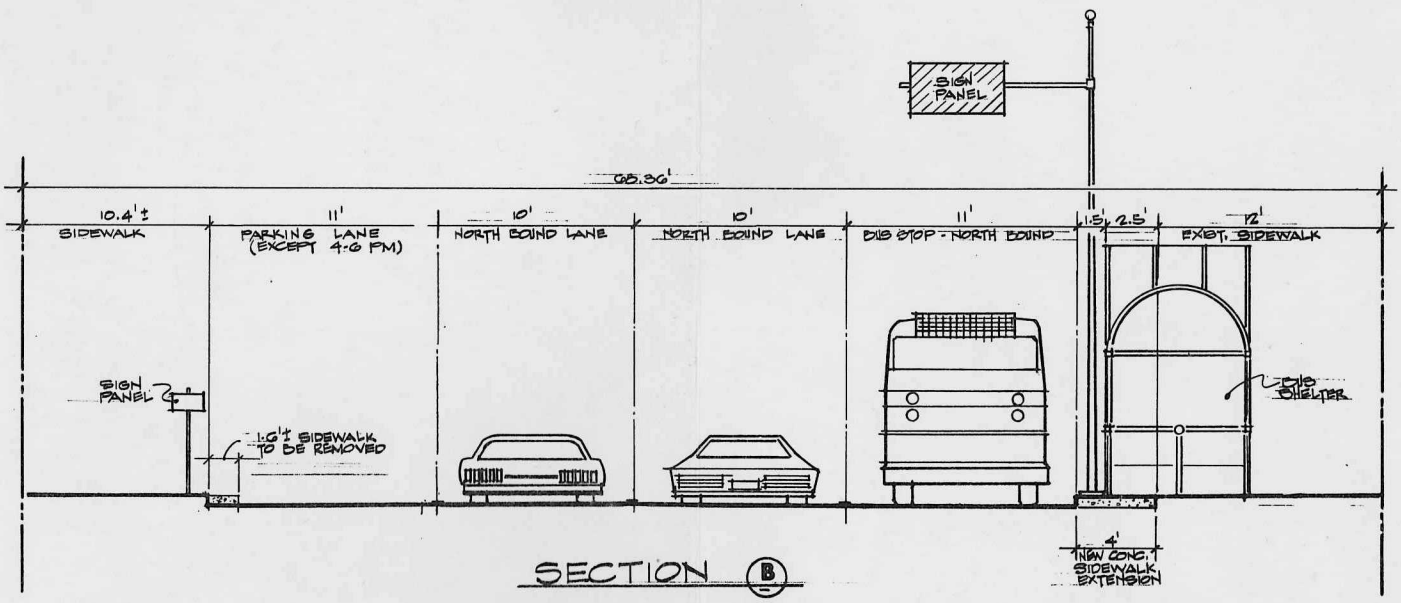
FRONT/BATTERY FINANCIAL DISTRICT LOADING ZONES

KAISER ENGINEERS


CLAY ST.
COMMERCIAL ST.
SACRAMENTO ST.
HALLECK ST.
CALIFORNIA ST.
SANSOME ST.
BATTERY ST.
PINE ST.
N
NO PARKING 7-9 AM
BUSES ONLY 7-9 AM
NO PARKING 4-6 PM
BUSES ONLY 4-6 PM
NEW 11' CONC. BUS LANE
NEW 12' CONC. BUS LANE
LIMITS OF BUS SHELTER
EDGE OF LOADING PLATFORM (TYP.)
NEW SOLID WHITE 9" STRIPE (TYPICAL)
NEW BROKEN WHITE 4" STRIPE (TYP.) (9' LONG, 15' CLEAR)
PLAN
50' 0' 50' 100'



SECTION (A)



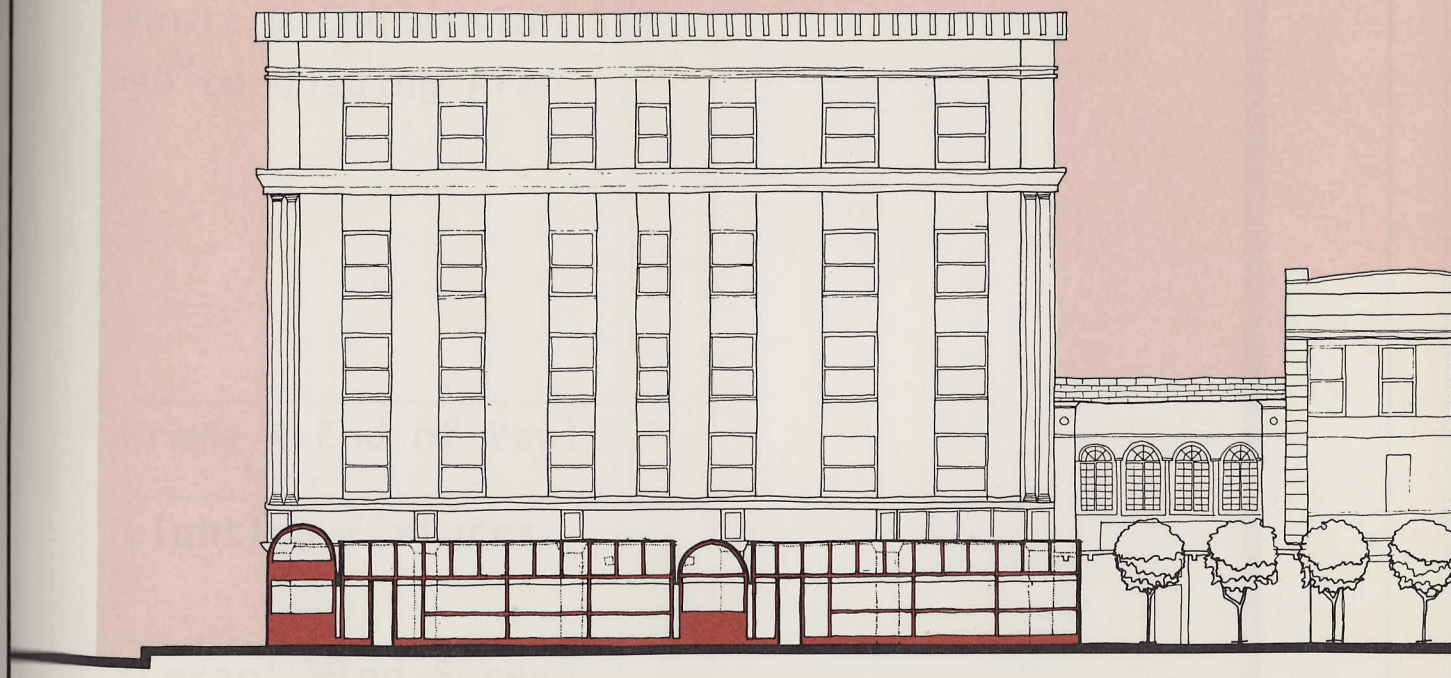
SECTION (B)

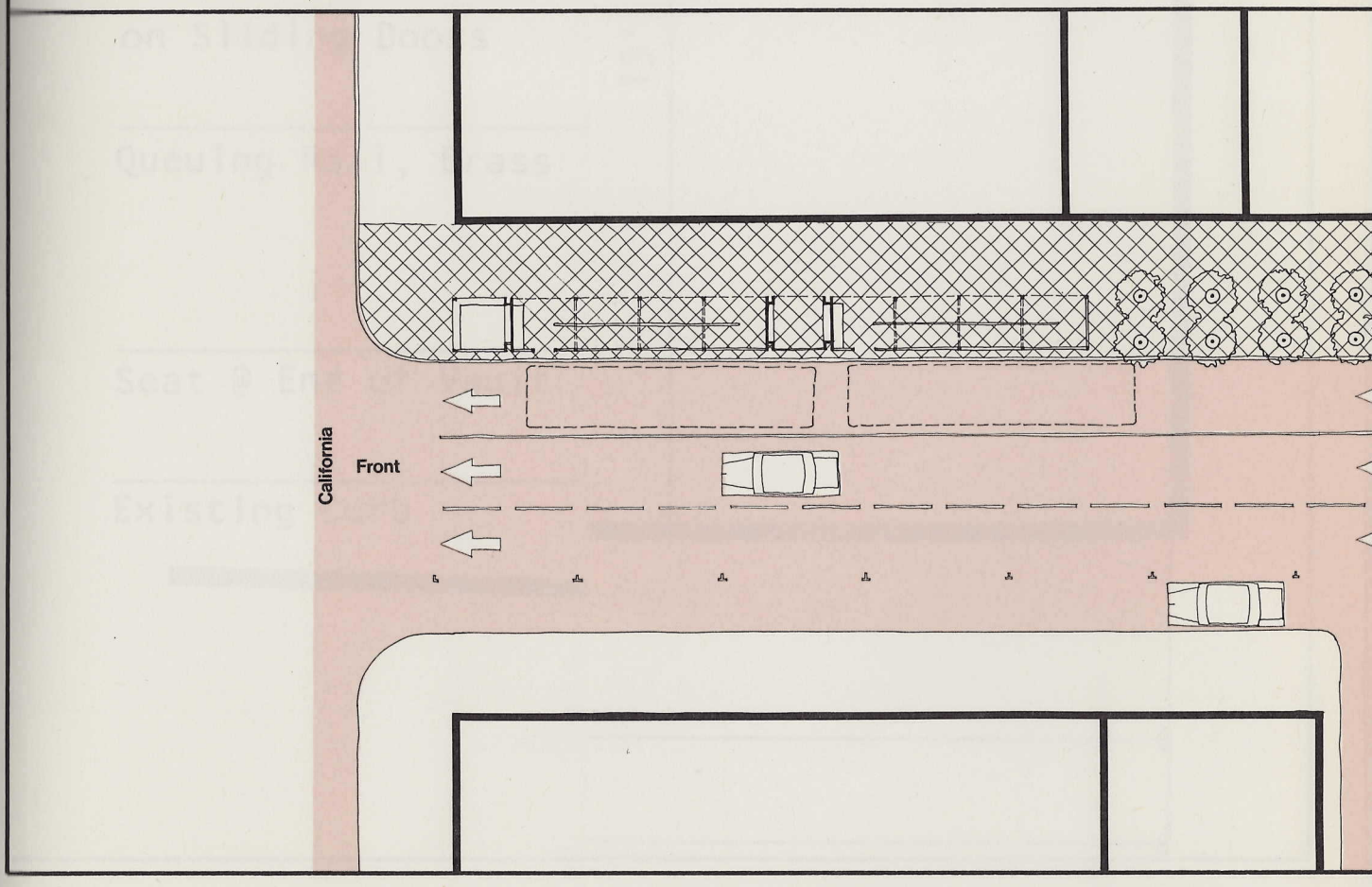
V-25

FIGURE ~~V-26~~

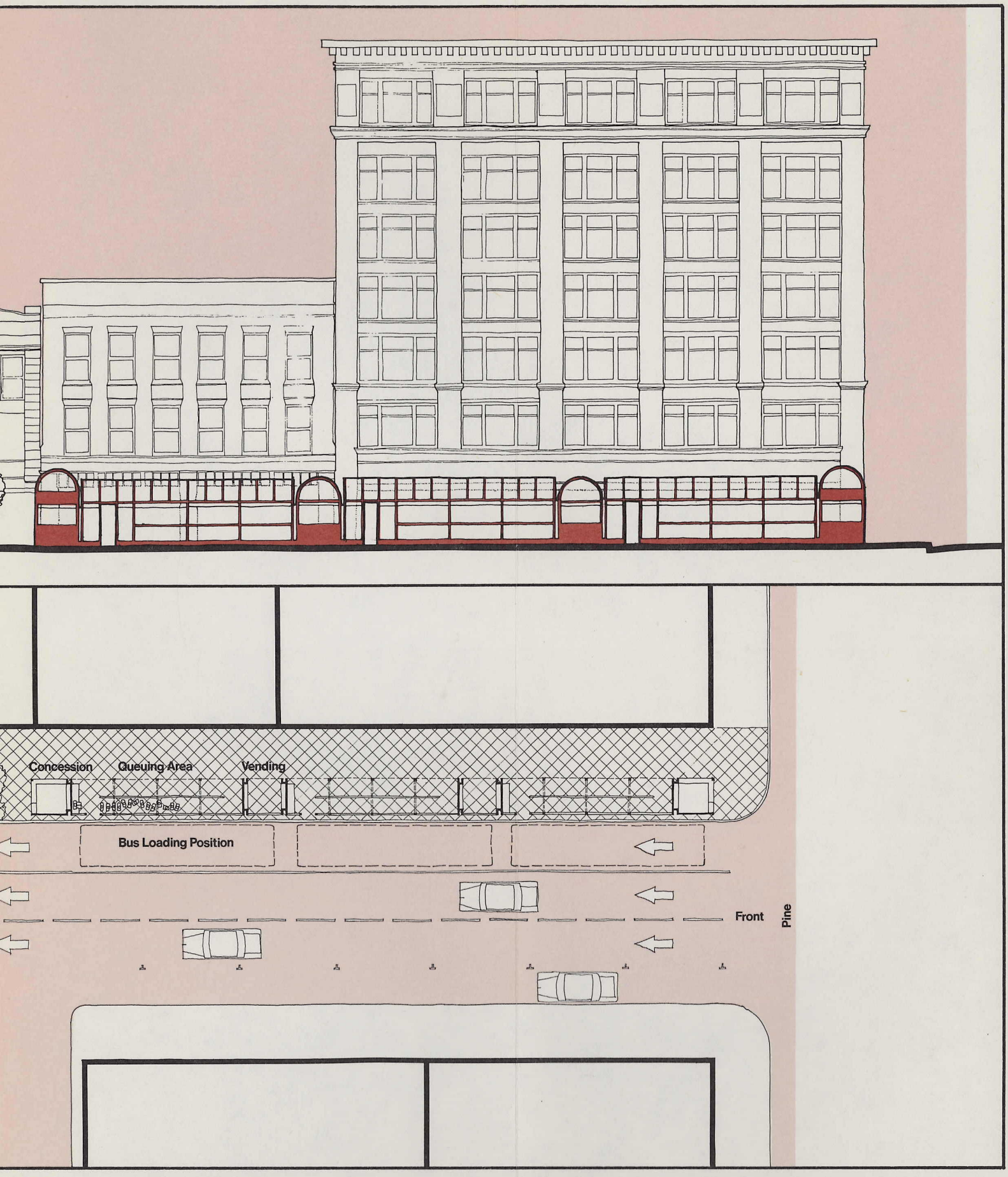
BATTERY/SANSOME FINANCIAL DISTRICT LOADING ZONES

KAISER ENGINEERS

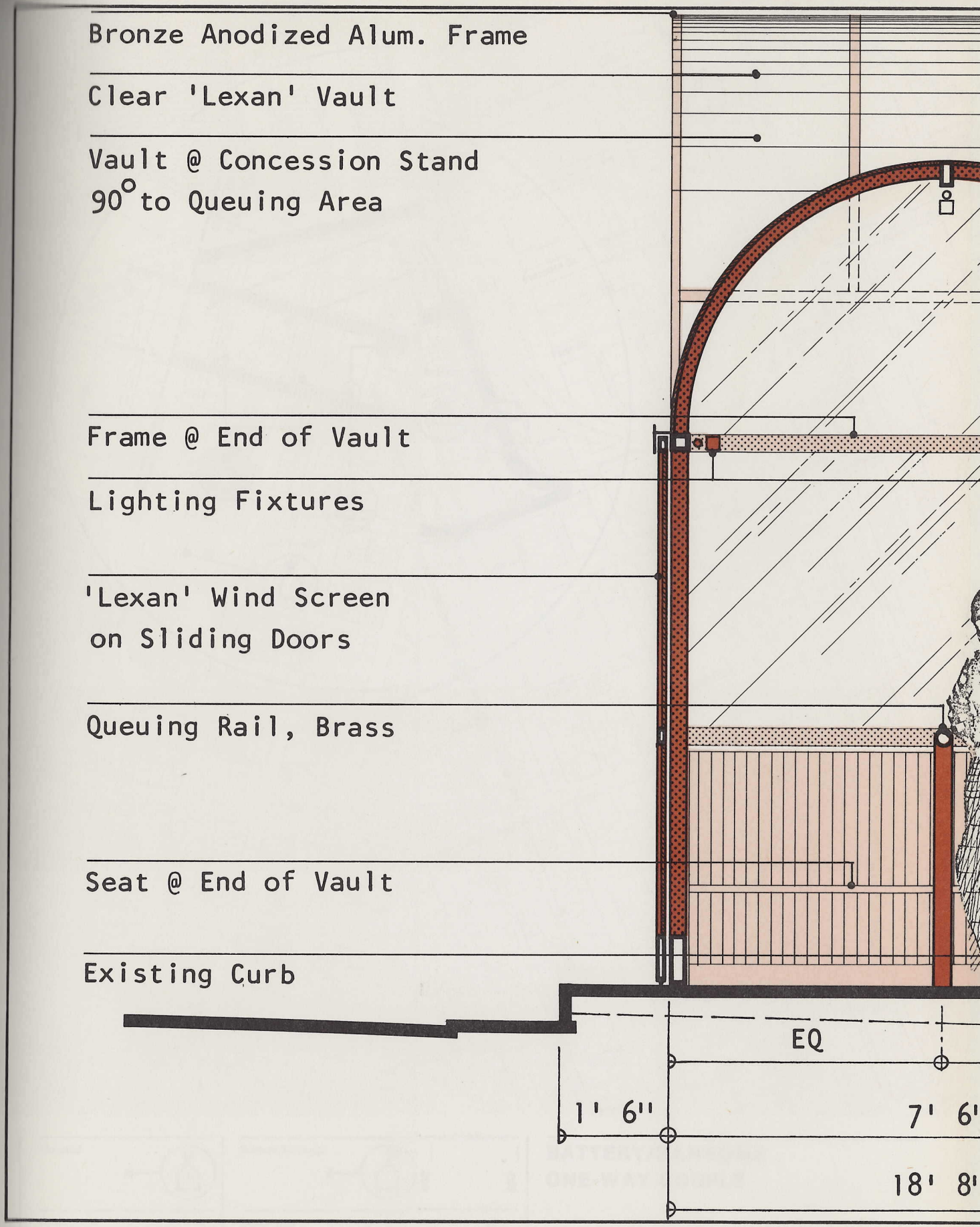




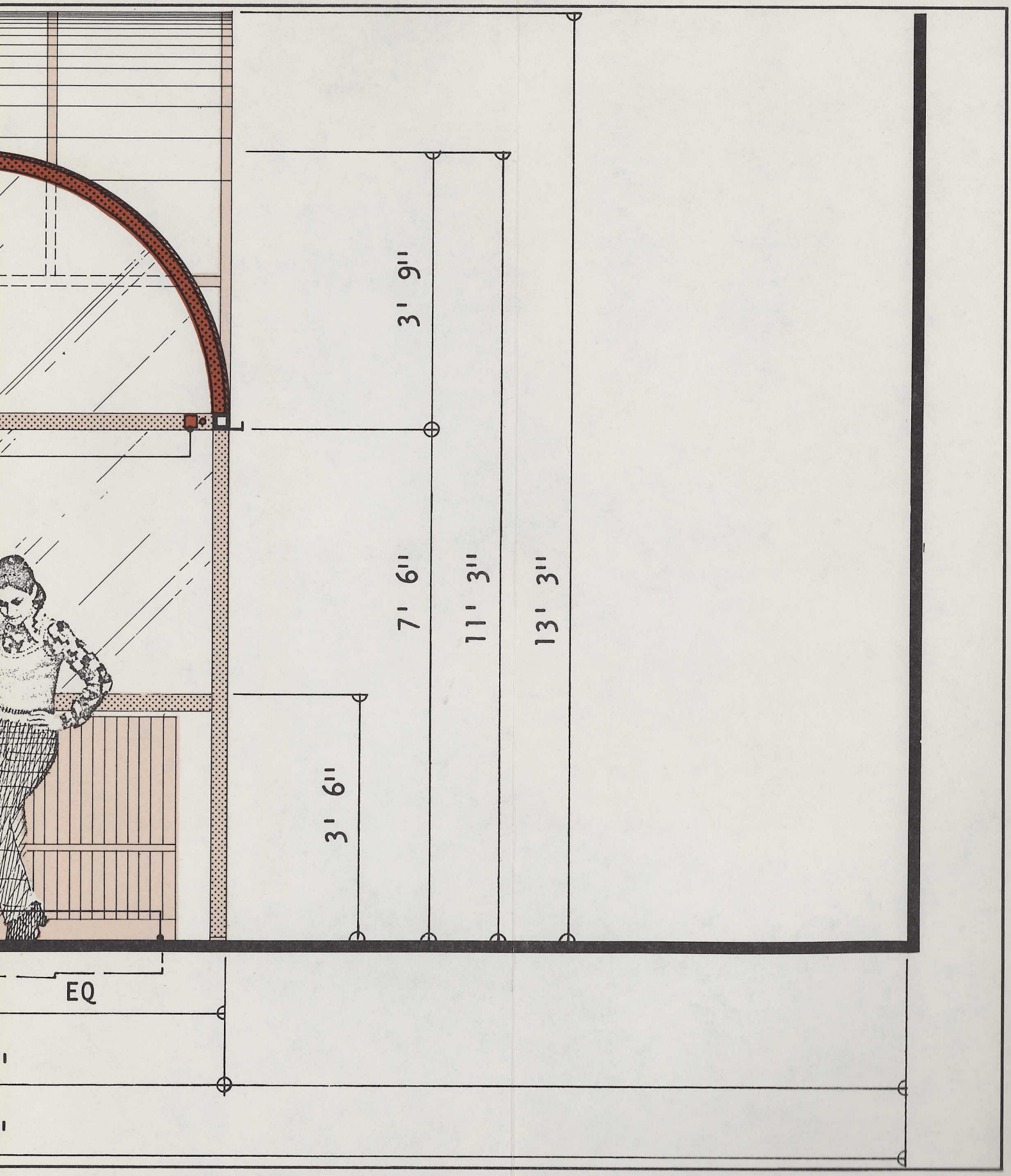
FRONT STREET - FINANCIAL DISTR



RICT LOADING ZONE WITH BUS SHELTER



TYPICAL BUS S



SHELTER - SECTION

Hospital

Open Space

Structure

Schools/Colleges

Residential Noise Impact Potential

Noise Impact Potential

Historic Landmark

Landmark

Displaced Activity

Parking

Demand Stop

Business/ Employment

Elevator

Underground R.O.W. Easement

Access to Station

Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

5 Min. Walk To Station

R = 1320'

BATTERY/SANSOME ONE-WAY COUPLE

(IMPACT MAP)

FIGURE V - 28

GOLDEN GATE
SAN FRANCISCO BAY
PACIFIC OCEAN
CITY & COU
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK
800'

FIGURE V-29

SINGLE SUBSURFACE ROUTE SYSTEM
LOMBARD - COLUMBUS - KEARNY

KAISER ENGINEERS

GOLDEN GATE
SAN FRANCISCO BAY
PACIFIC OCEAN
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK
800'

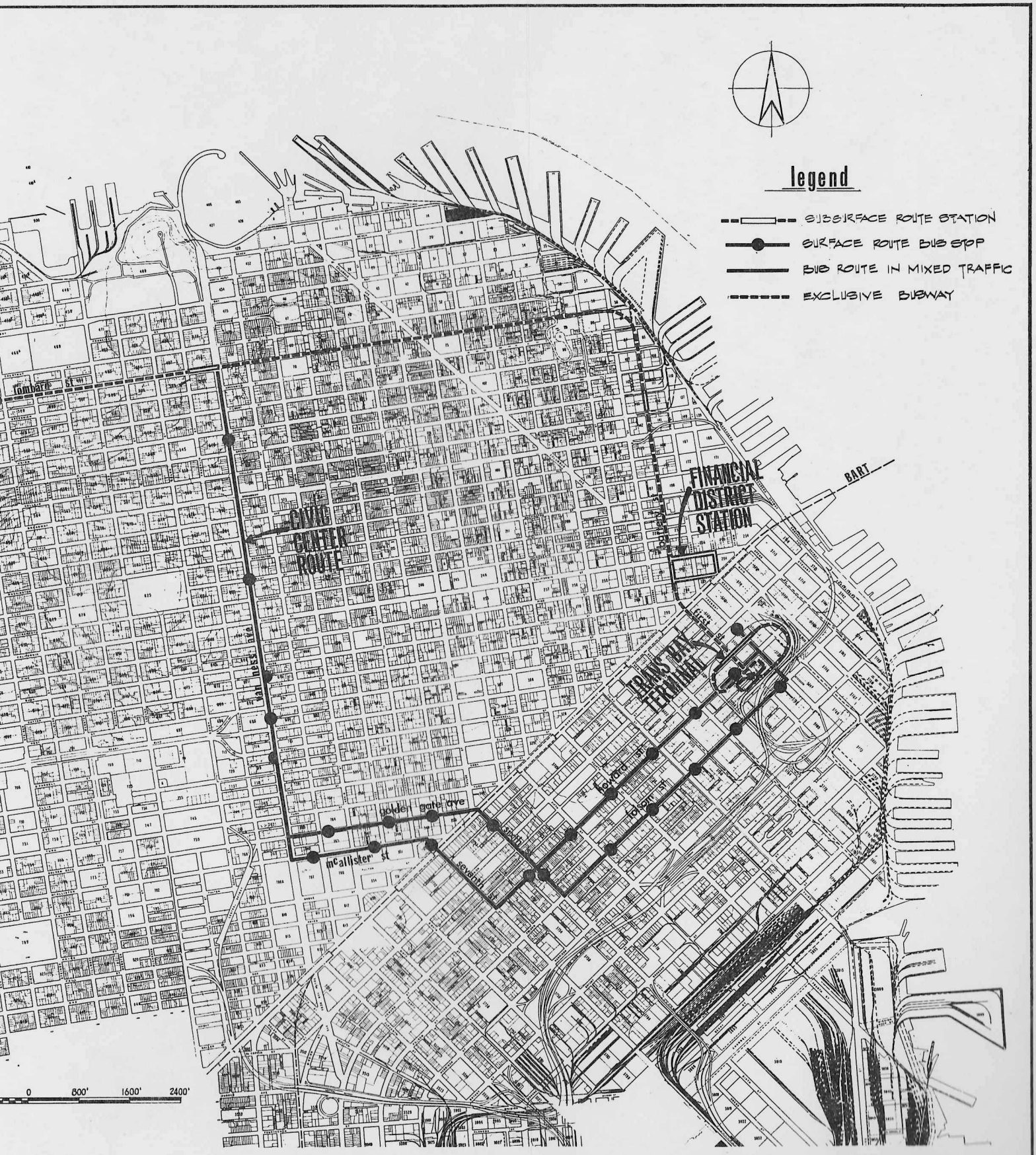
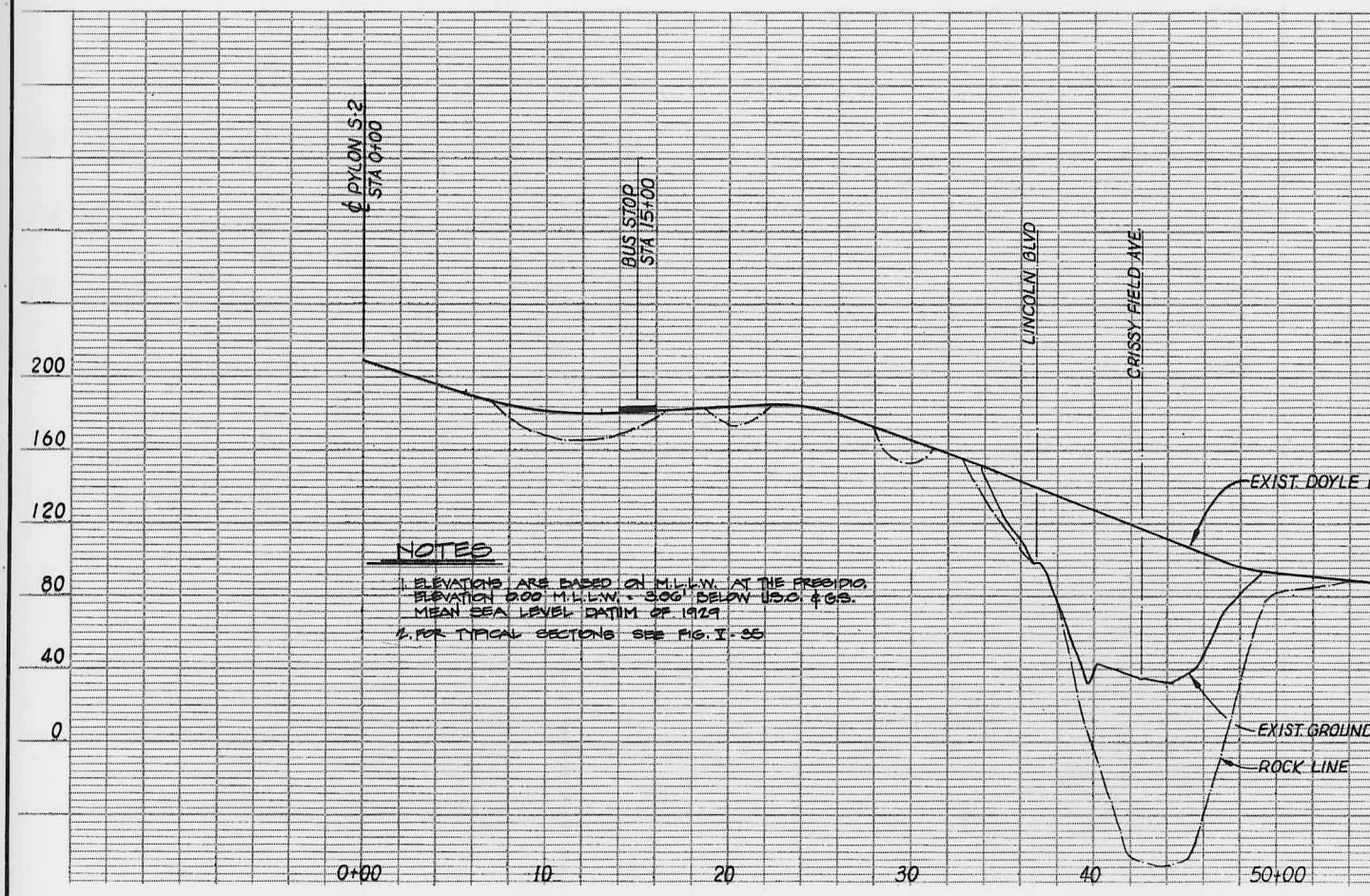


FIGURE V-30

SINGLE SUBSURFACE ROUTE SYSTEM
LOMBARD - BATTERY

KAISER ENGINEERS



NOTES

1. ELEVATIONS ARE BASED ON M.L.L.W. AT THE PRESIDIO, ELEVATION 0.00 M.L.L.W. = 3.06' BELOW U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929.
2. FOR TYPICAL SECTIONS SEE FIG. I-35

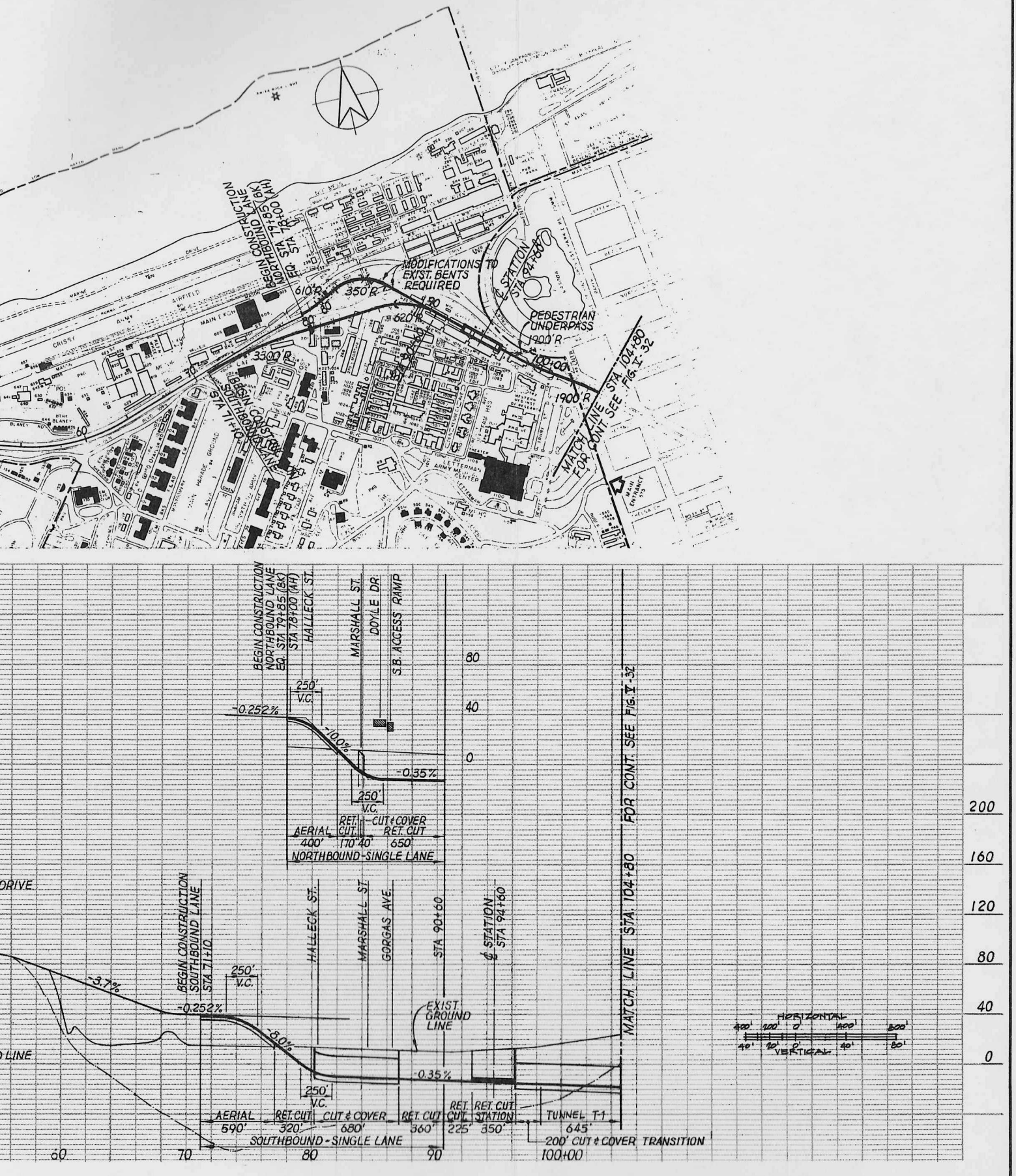
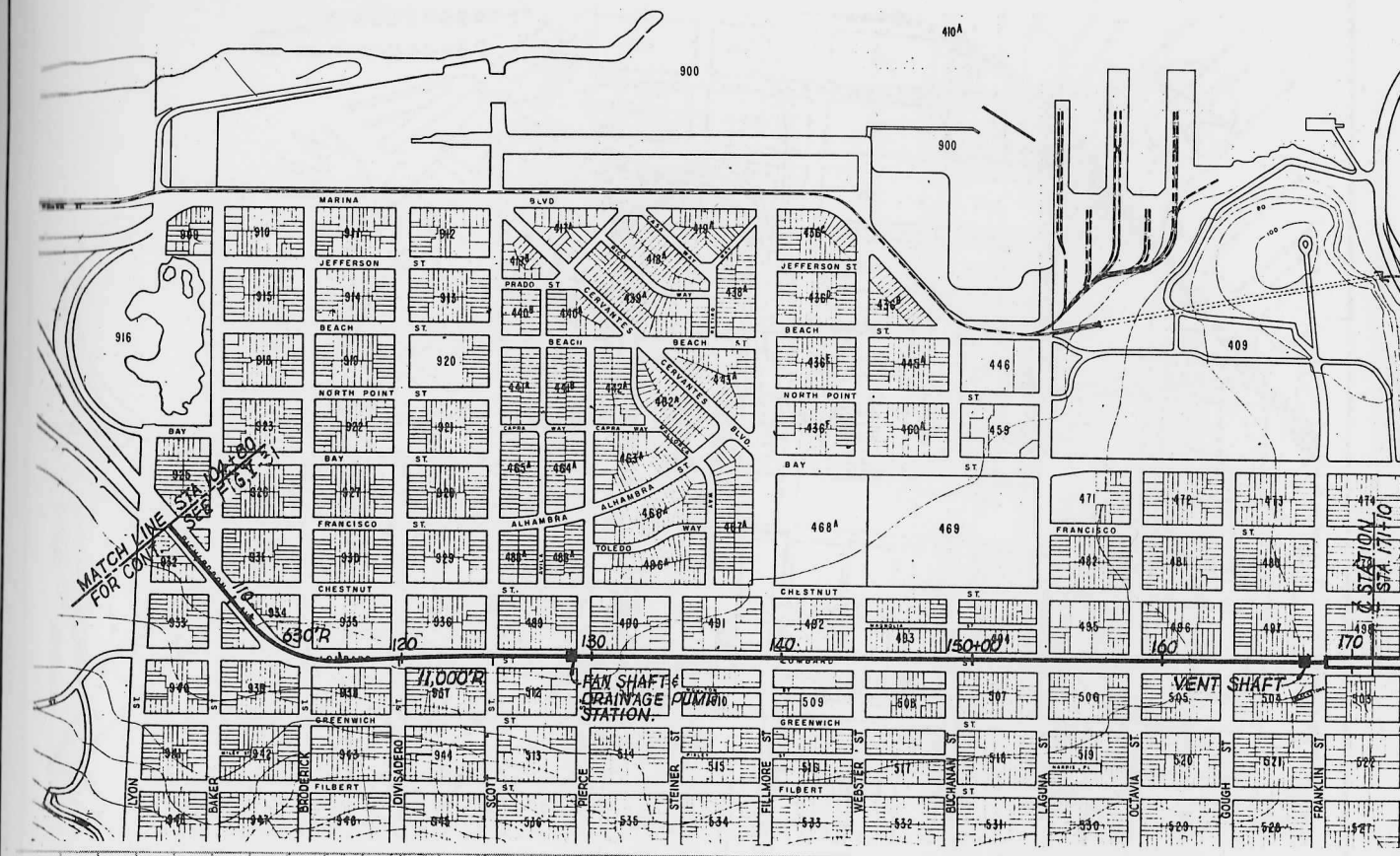
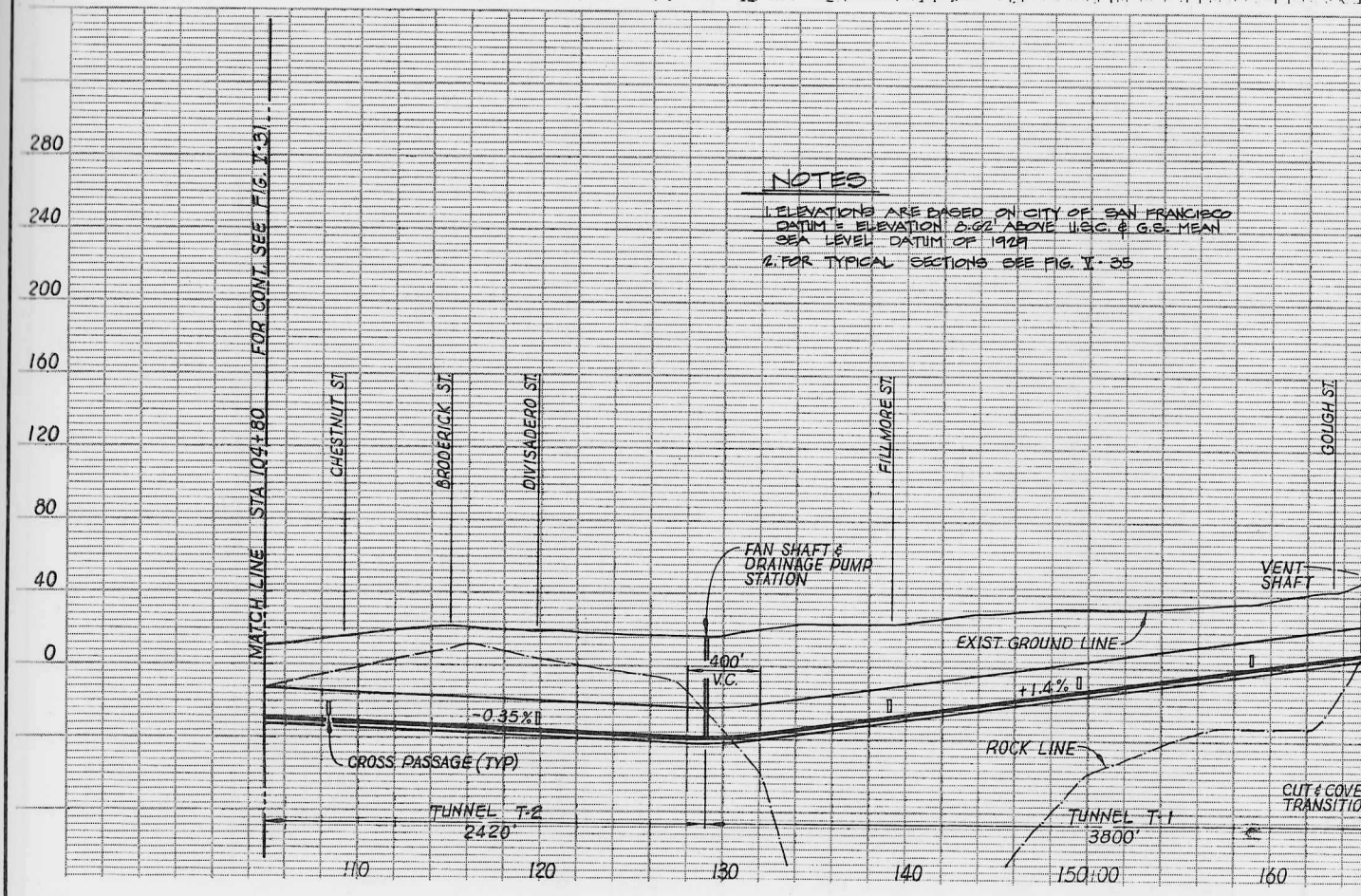


FIGURE V-31

SINGLE SUBSURFACE ROUTE SYSTEM
PLAN AND PROFILE - DOYLE DRIVE

KAISER ENGINEERS





NOTES

1. ELEVATIONS ARE BASED ON CITY OF SAN FRANCISCO DATUM = ELEVATION 5.62 ABOVE U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929
2. FOR TYPICAL SECTIONS SEE FIG. V-35

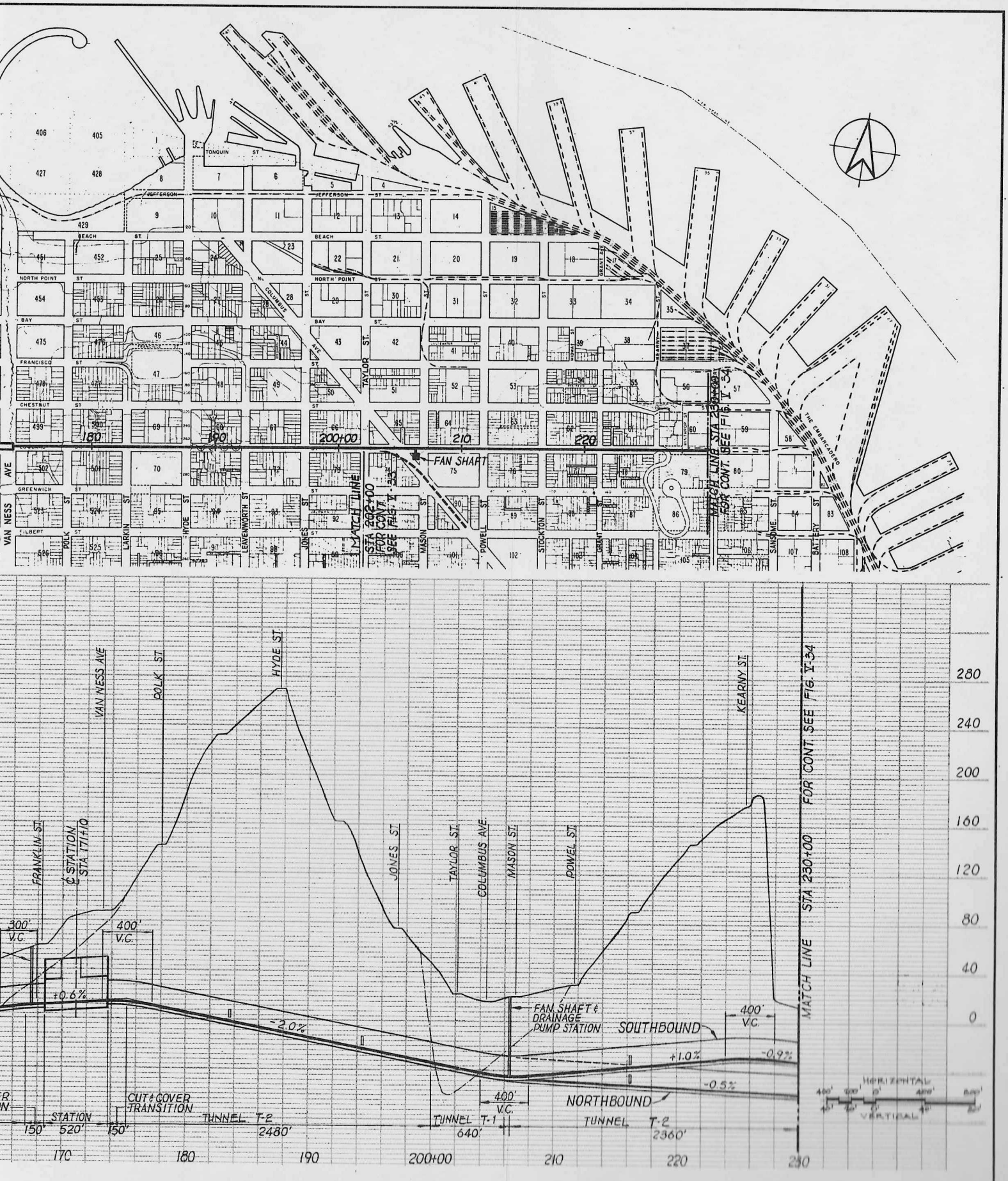
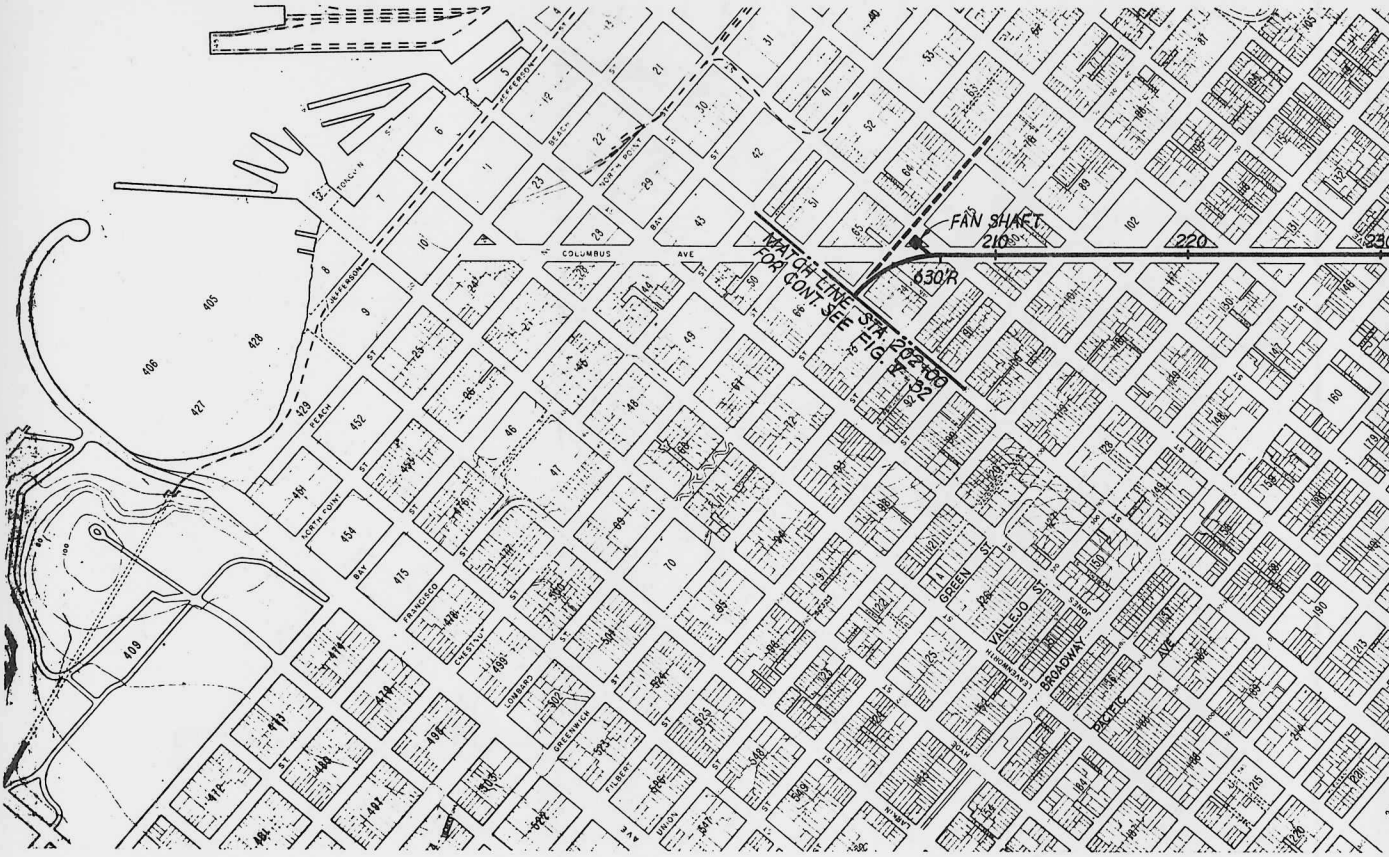
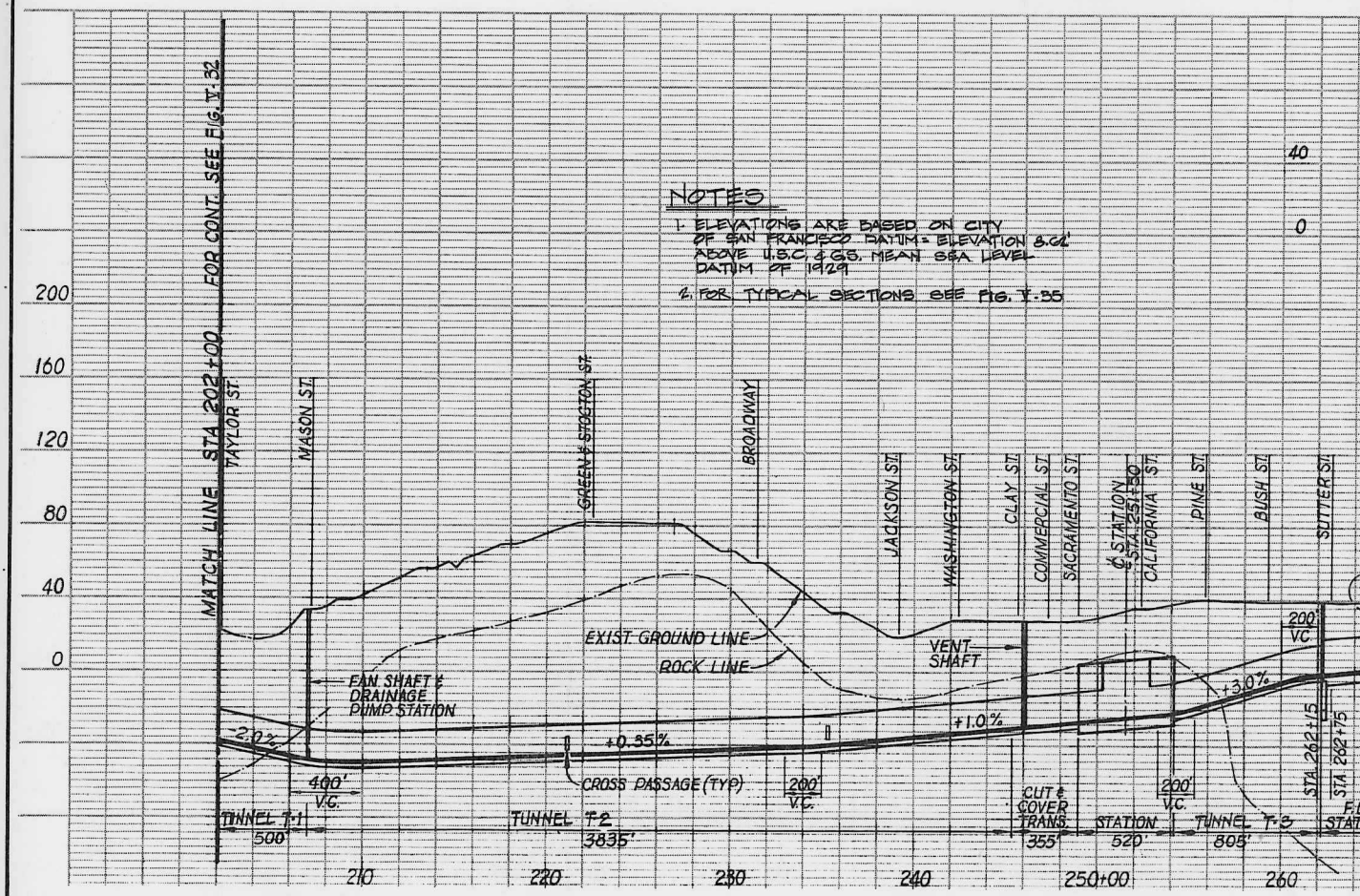


FIGURE V-32

SINGLE SUBSURFACE ROUTE SYSTEM PLAN AND PROFILE - LOMBARD STREET

KAISER


FAN SHAFT
210
220
MATCH LINE STA 202+00
FOR CONT. SEE FIG. T-32
630'R
COLUMBUS AVE
BAY
FRANCISCO
NORTH POINT
BEACH
JEFFERSON
CHESTNUT
LOMBARD
GREENWICH
FILBERT
UNION
GREEN ST
VALLEJO ST
BROADWAY
PACIFIC


NOTES
1. ELEVATIONS ARE BASED ON CITY OF SAN FRANCISCO DATUM = ELEVATION 8.62' ABOVE U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929
2. FOR TYPICAL SECTIONS SEE FIG. T-35
MATCH LINE STA 202+00 FOR CONT. SEE FIG. T-32
TAYLOR ST
MASON ST
GREEN & STOCTON ST
BROADWAY
JACKSON ST
WASHINGTON ST
CLAY ST
COMMERCIAL ST
SACRAMENTO ST
℄ STATION STA 251+50
CALIFORNIA ST
PINE ST
BUSH ST
SUTTER ST
EXIST GROUND LINE
ROCK LINE
VENT SHAFT
FAN SHAFT & DRAINAGE PUMP STATION
CROSS PASSAGE (TYP)
200' V.C.
400' V.C.
+0.35%
+1.0%
+3.0%
-2.0%
TUNNEL T-1
500'
TUNNEL T-2
3835'
CUT & COVER TRANS.
355'
STATION
520'
TUNNEL T-3
805'
STA 262+15
STA 262+75
200
160
120
80
40
0
210
220
230
240
250+00
260

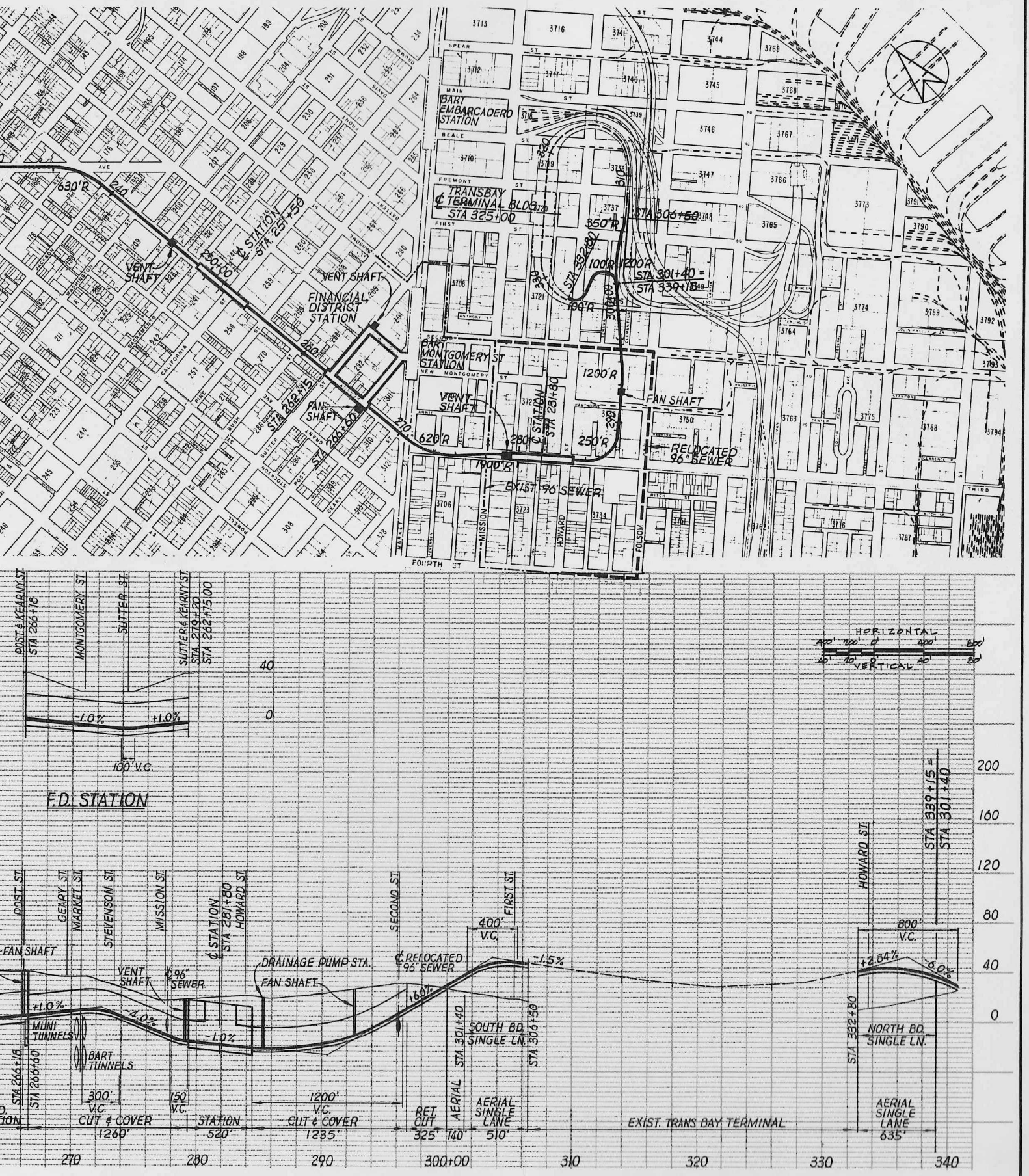
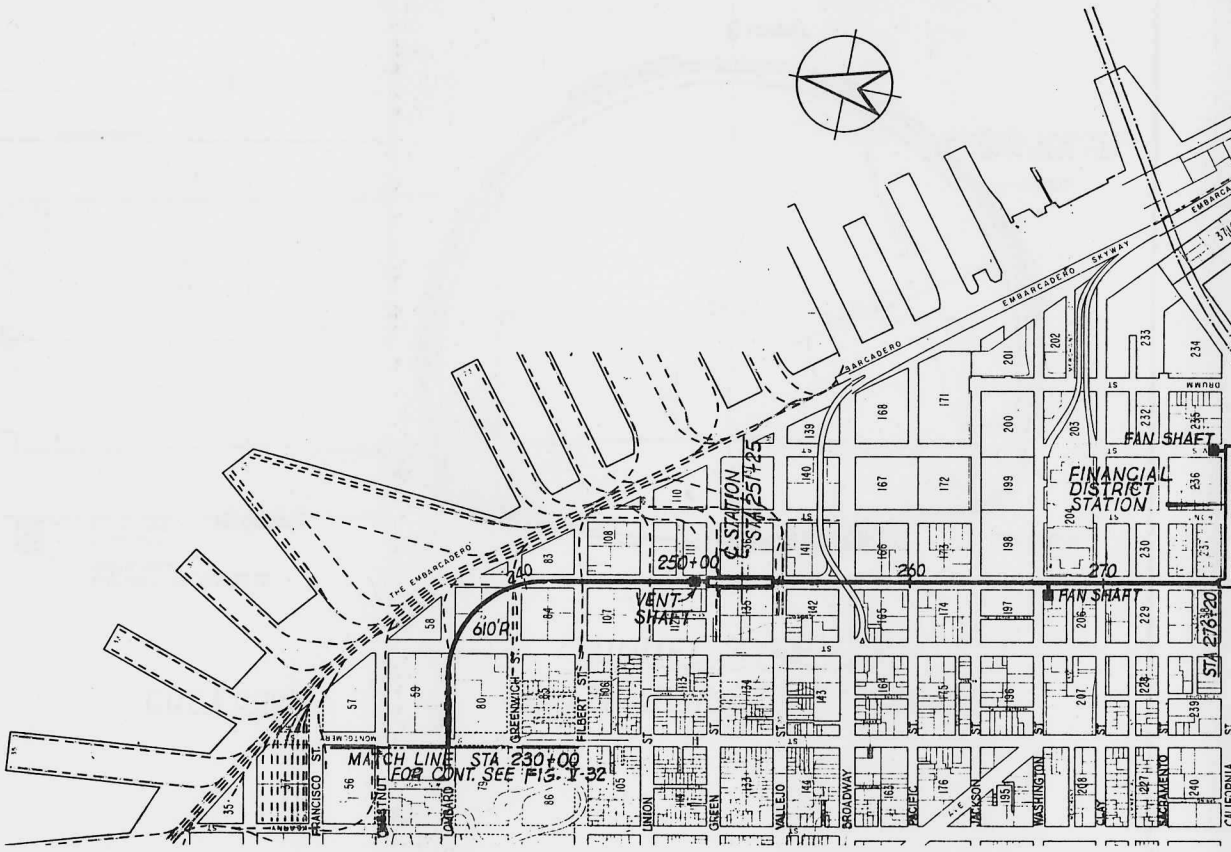
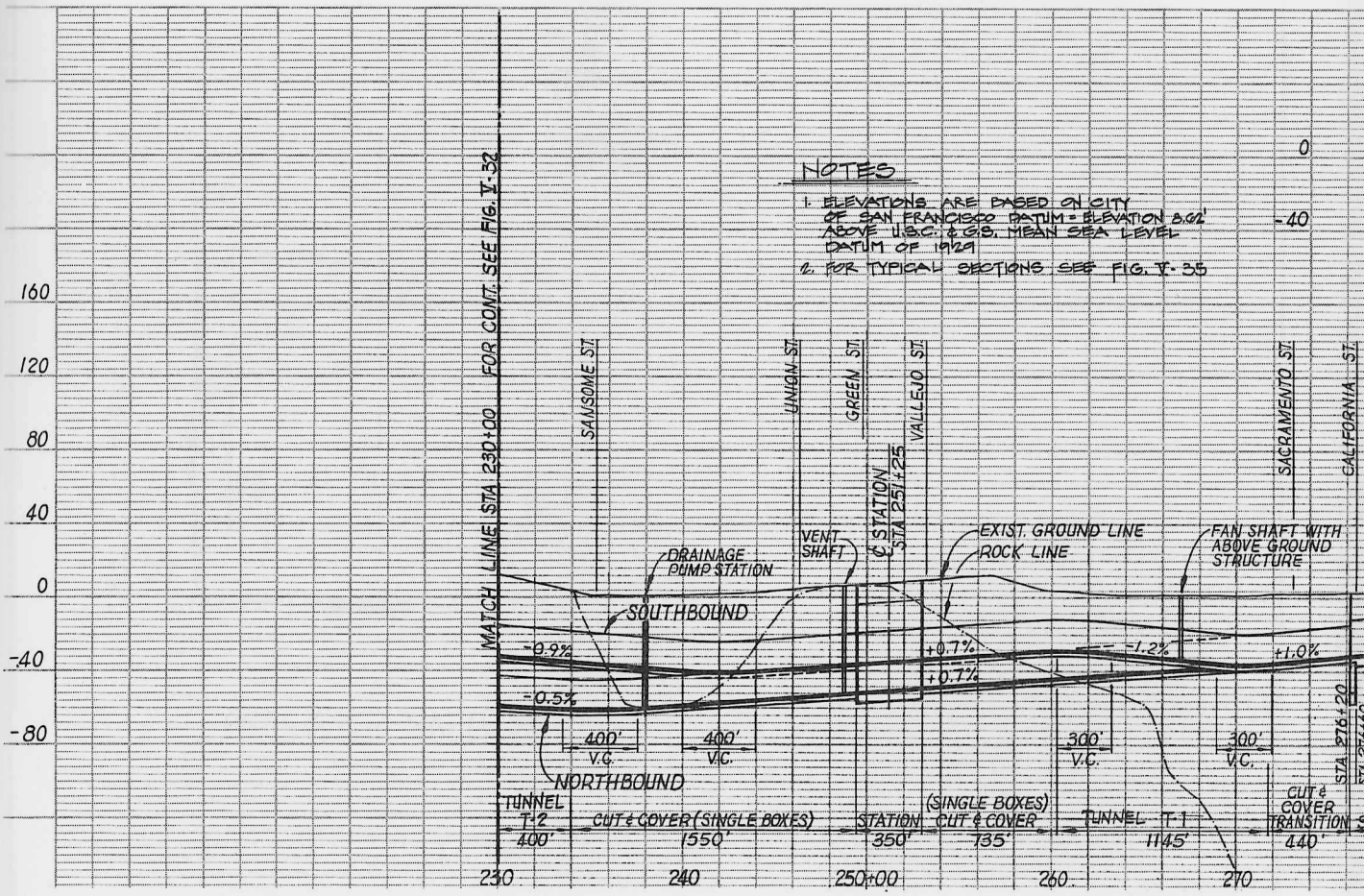


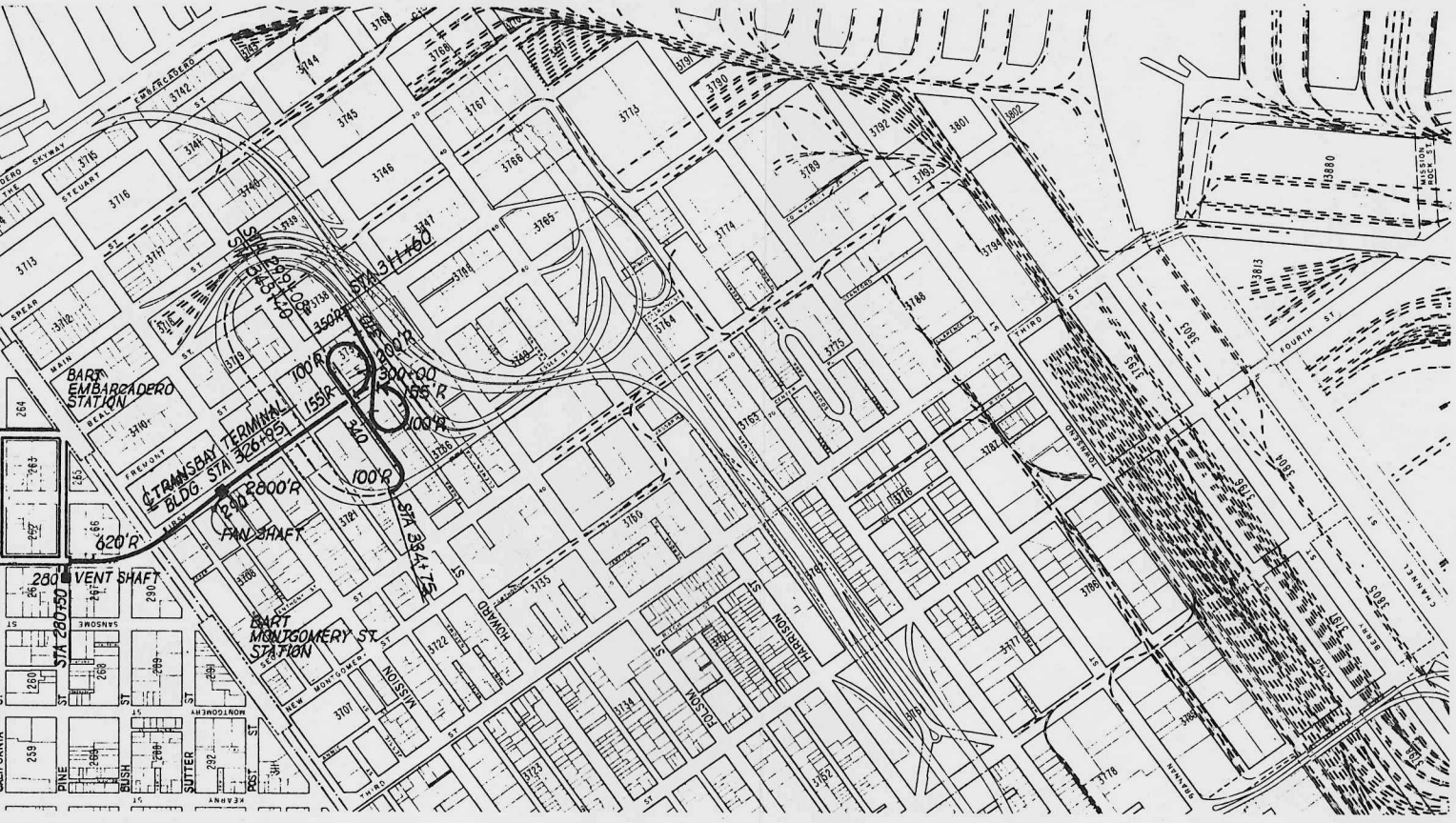
FIGURE V-33

SINGLE SUBSURFACE ROUTE SYSTEM
PLAN AND PROFILE - COLUMBUS - KEARNY

KAISER ENGINEERS


EMBARCADERO
EMBARCADERO SKYWAY
THE EMBARCADERO
FAN SHAFT
FINANCIAL DISTRICT STATION
℄ STATION STA 251+25
VENT SHAFT
610'R
250+00
240
260
270
STA 276+20
MATCH LINE STA 230+00
FOR CONT. SEE FIG. T-32
MONTGOMERY ST
SANSOME ST
GREENWICH ST
FILBERT ST
UNION ST
GREEN ST
VALLEJO ST
BROADWAY
PACIFIC
JACKSON
WASHINGTON
SACRAMENTO


NOTES
1. ELEVATIONS ARE BASED ON CITY OF SAN FRANCISCO DATUM = ELEVATION 8.62' ABOVE U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929
2. FOR TYPICAL SECTIONS SEE FIG. T-35
MATCH LINE STA 230+00 FOR CONT. SEE FIG. T-32
SANSOME ST
UNION ST
GREEN ST
VALLEJO ST
SACRAMENTO ST
CALIFORNIA ST
DRAINAGE PUMP STATION
VENT SHAFT
℄ STATION STA 251+25
EXIST. GROUND LINE
ROCK LINE
FAN SHAFT WITH ABOVE GROUND STRUCTURE
SOUTHBOUND
NORTHBOUND
-0.9%
-0.5%
+0.7%
+0.7%
-1.2%
+1.0%
400' V.C.
400' V.C.
300' V.C.
300' V.C.
160
120
80
40
0
-40
-80
0
-40
TUNNEL T-2
400'
CUT & COVER (SINGLE BOXES)
1550'
STATION
350'
CUT & COVER (SINGLE BOXES)
735'
TUNNEL T-1
1145'
CUT & COVER TRANSITION
440'
230
240
250+00
260
270
STA 276+20



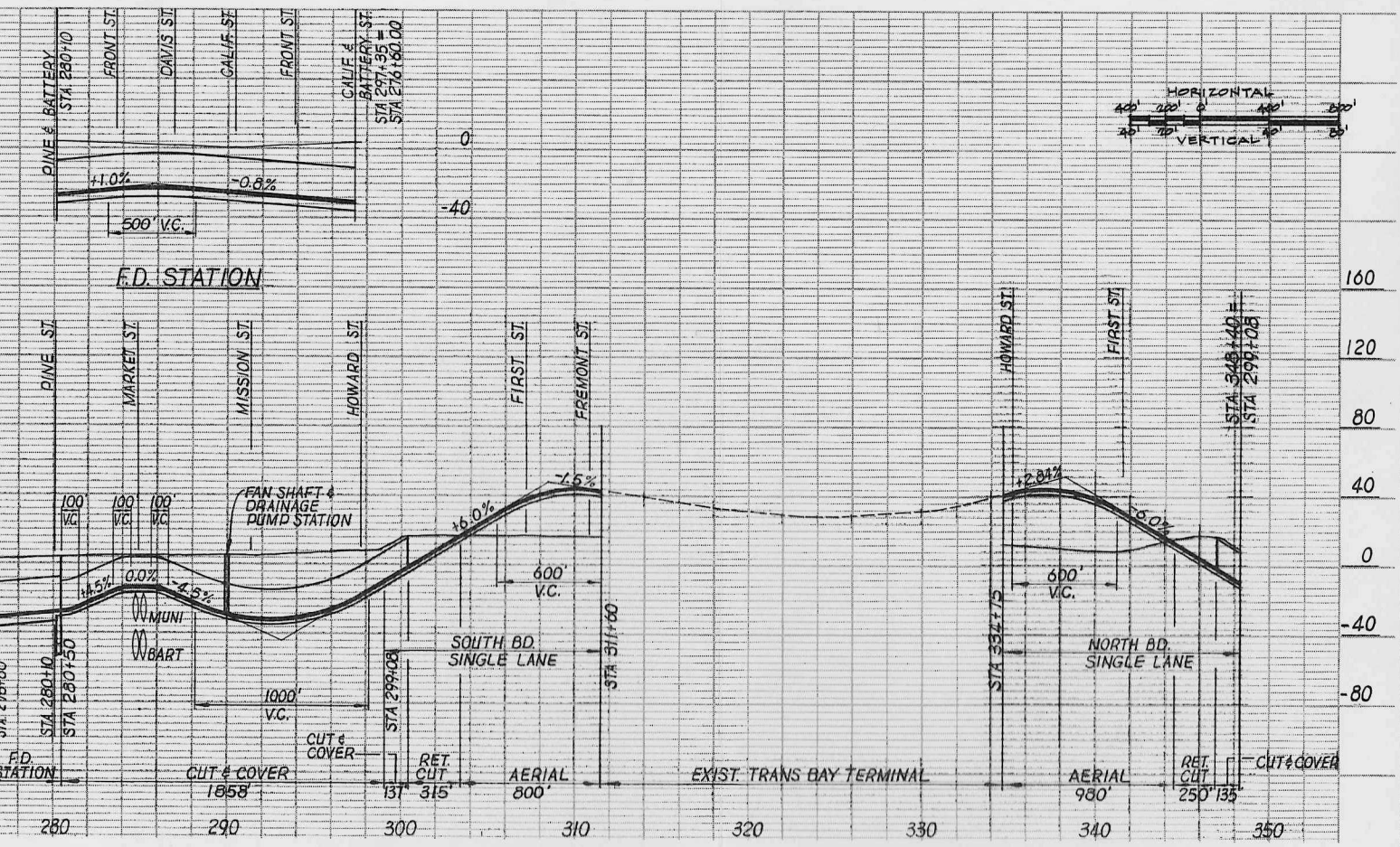
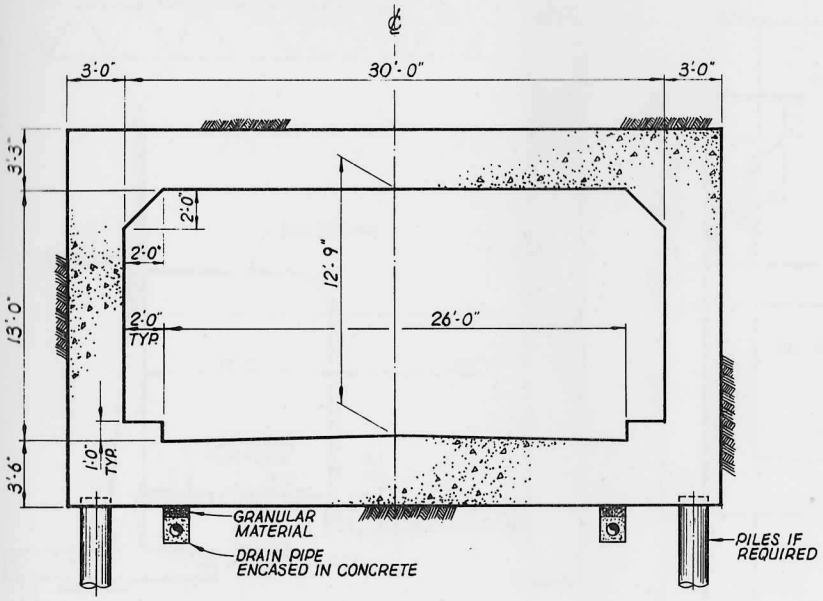


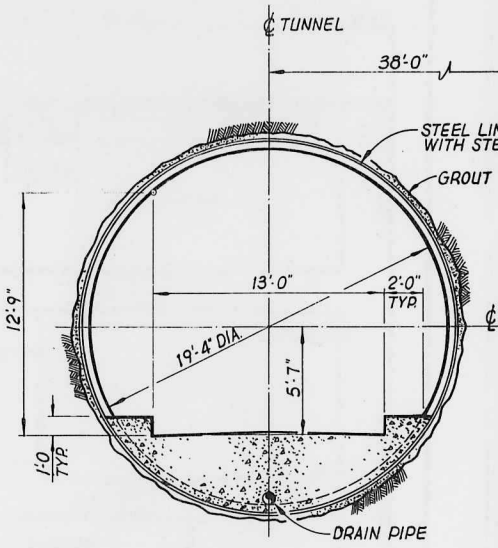
FIGURE V-34

SINGLE SUBSURFACE ROUTE SYSTEM PLAN AND PROFILE-BATTERY STREET

KAISER ENGINEERS

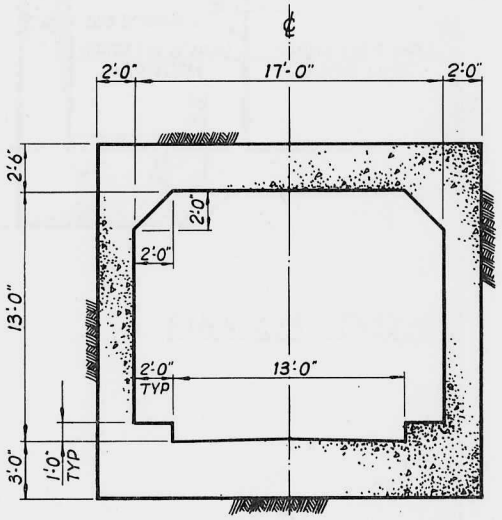


CUT & COVER

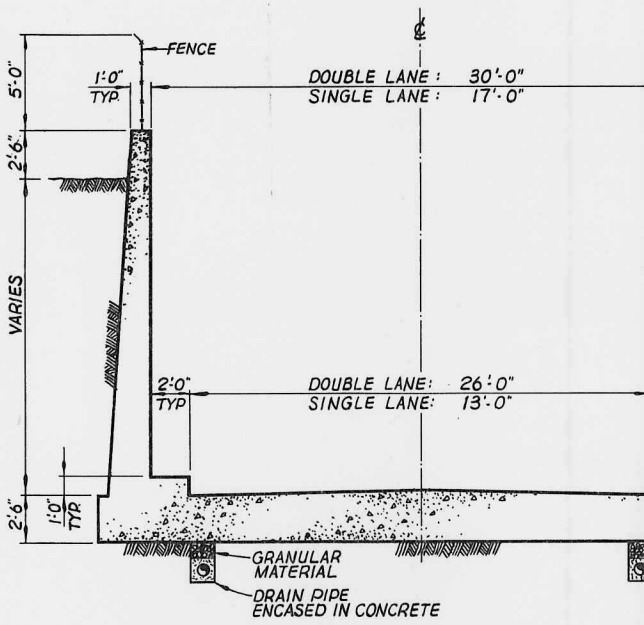


TUNNEL TYPE · T1

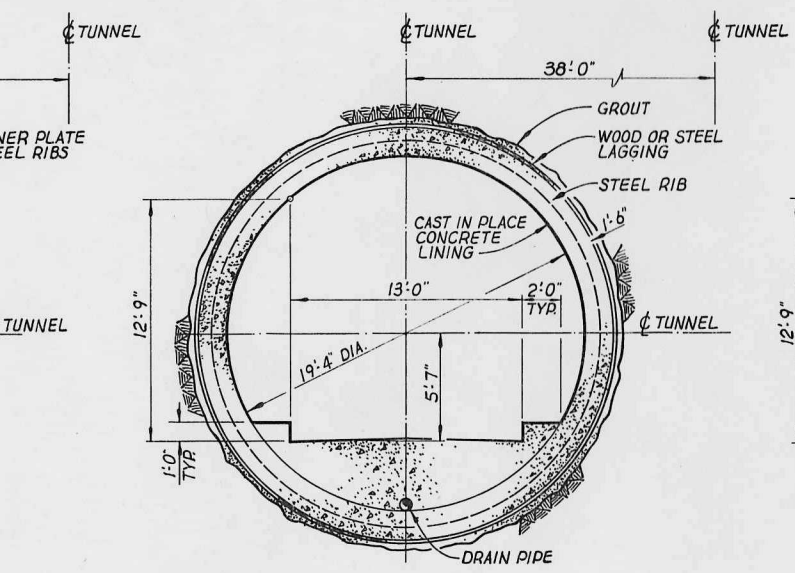
SINGLE LANE TUNNELS IN SOFT GRO



CUT & COVER · SINGLE BOX

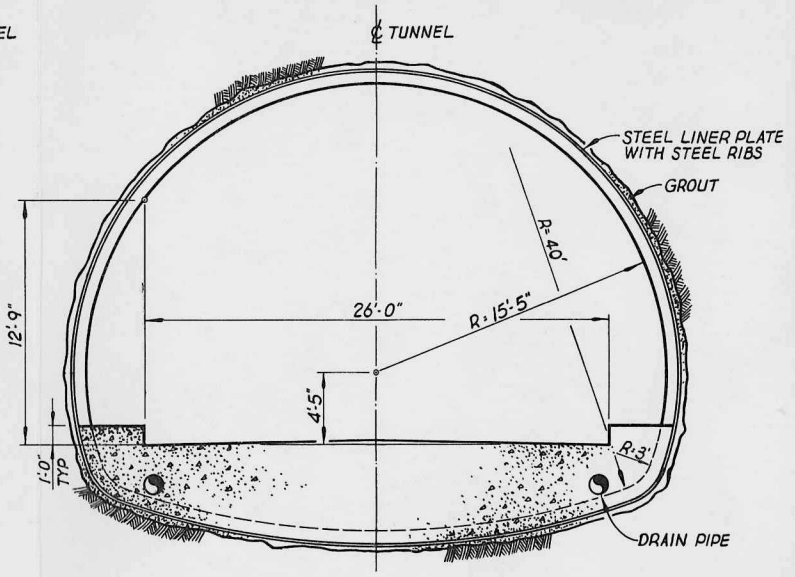


RETAINED CUT



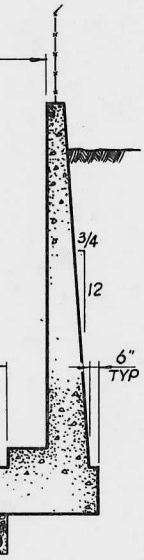
TUNNEL TYPE · T2

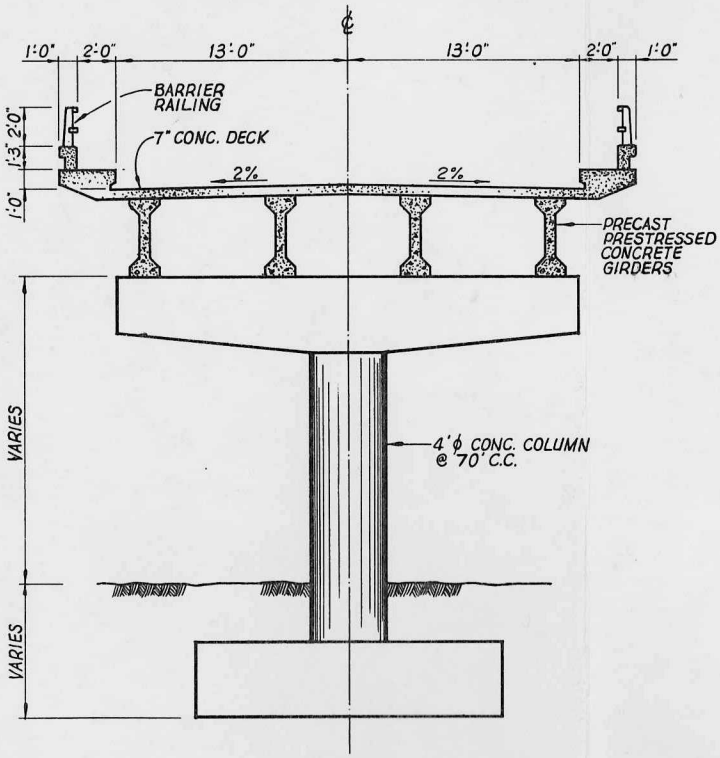
SINGLE LANE TUNNELS IN ROCK



TUNNEL TYPE · T3

TWO LANE TUNNEL IN SOFT GROUND



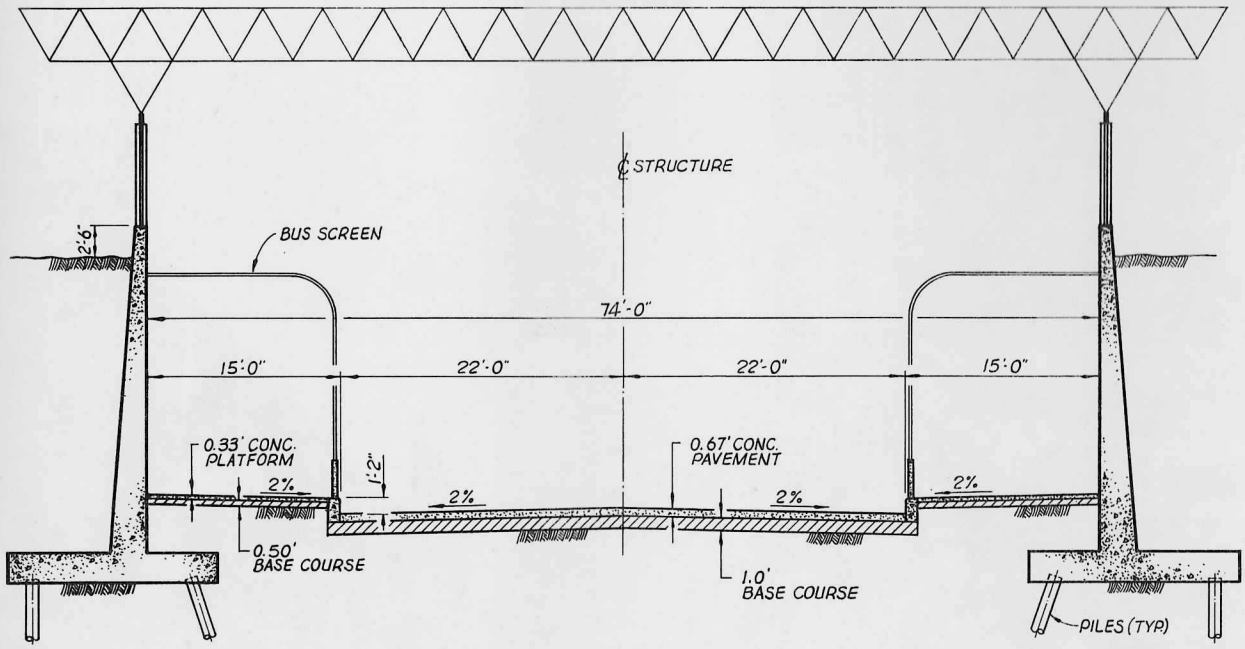


AERIAL

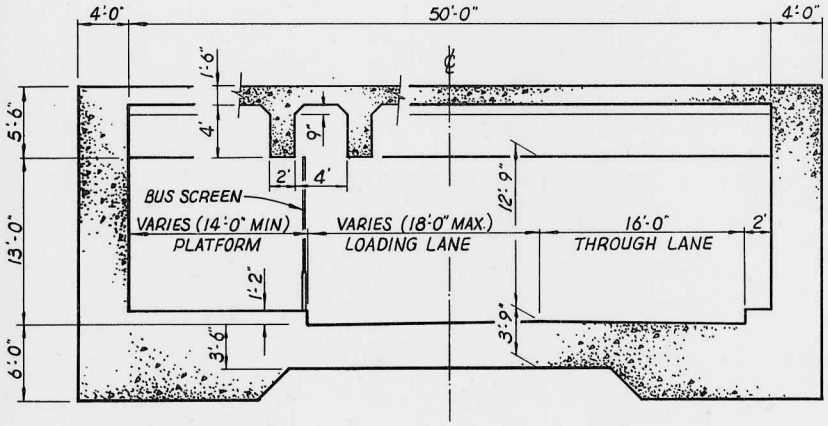
FIGURE V-35

TYPICAL SECTIONS

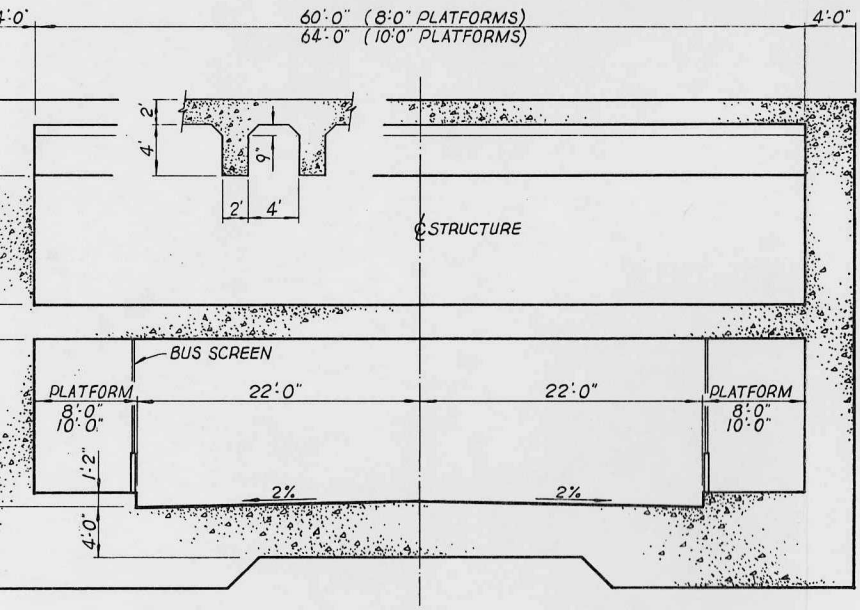
KAISER ENGINEERS



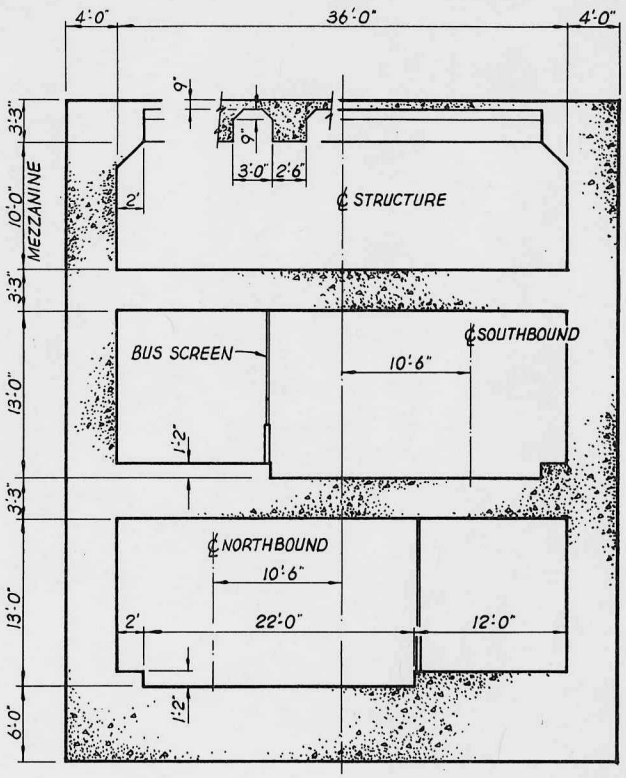
PRESIDIO STATION



FINANCIAL DISTRICT STATION



SUBWAY STATION

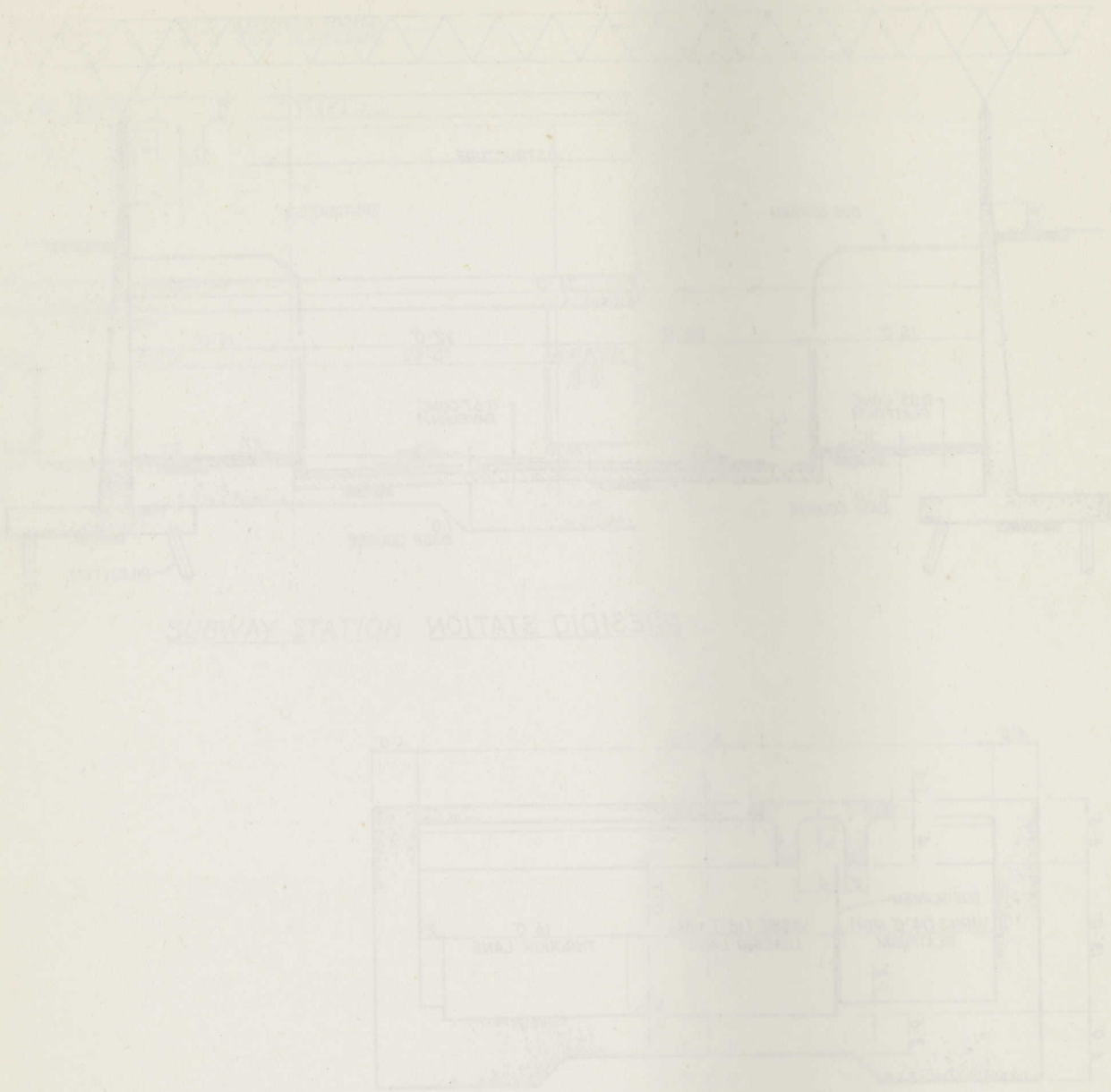


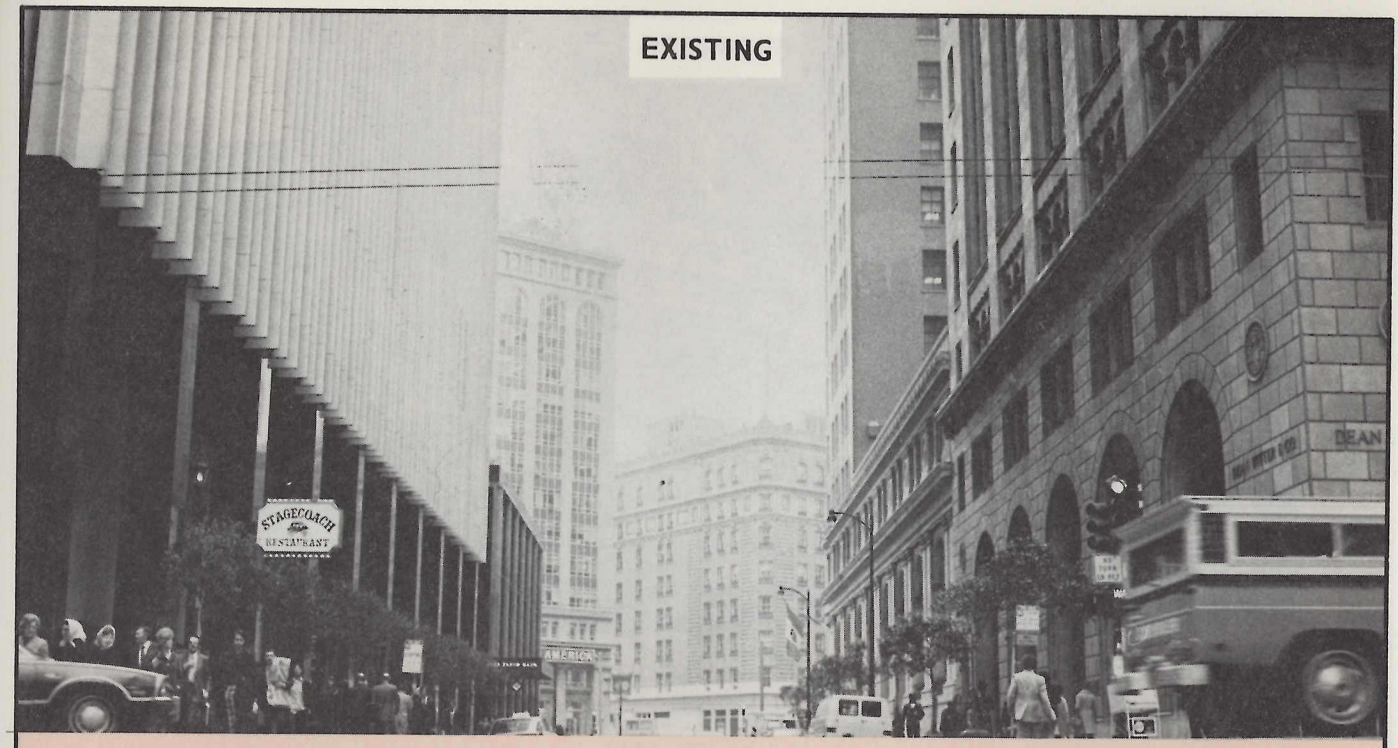
BATTERY/GREEN STATION

FIGURE V-36

TYPICAL SECTIONS

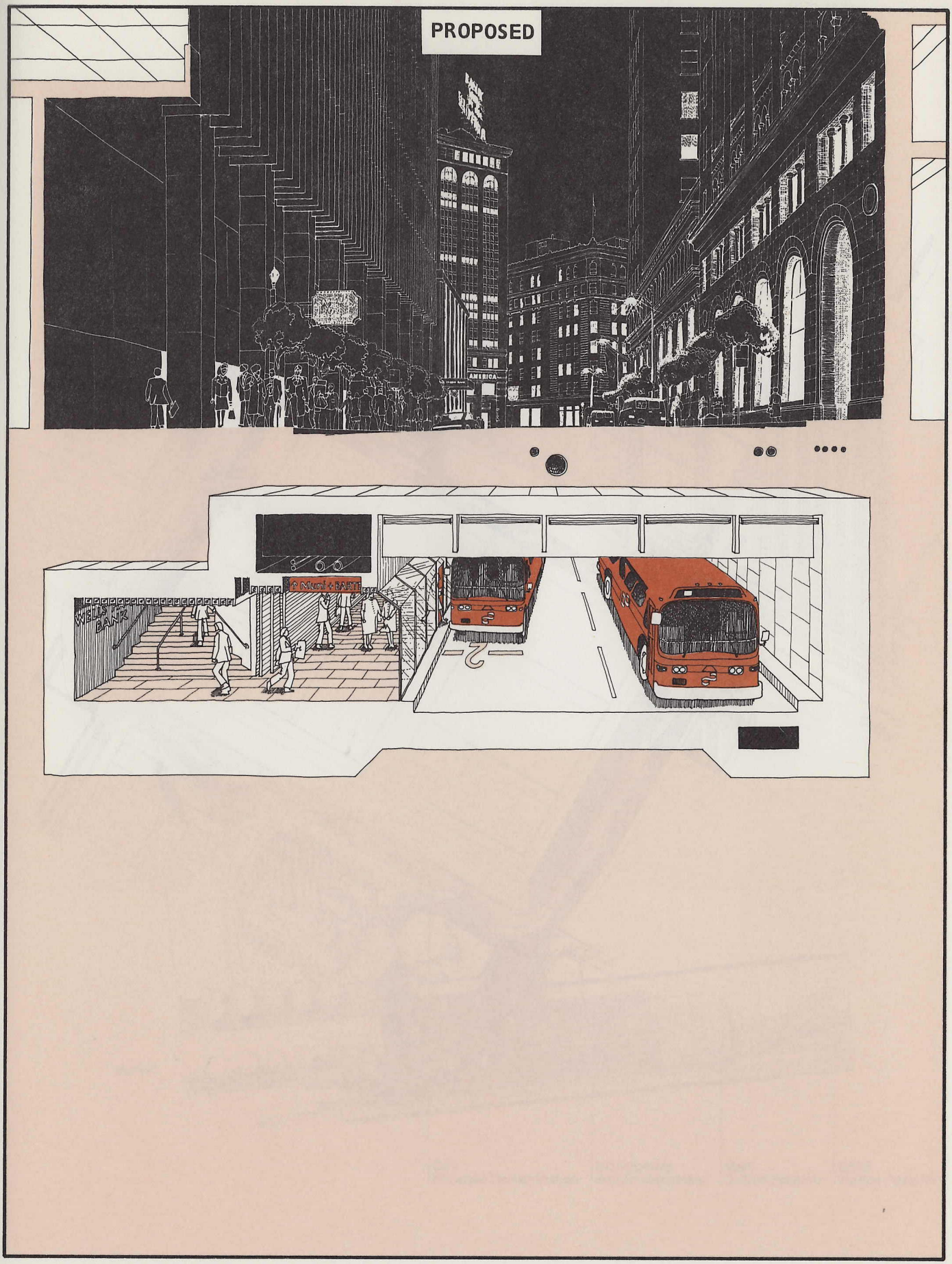
KAISER ENGINEERS





FINANCIAL DISTRICT - KEARNY STREET

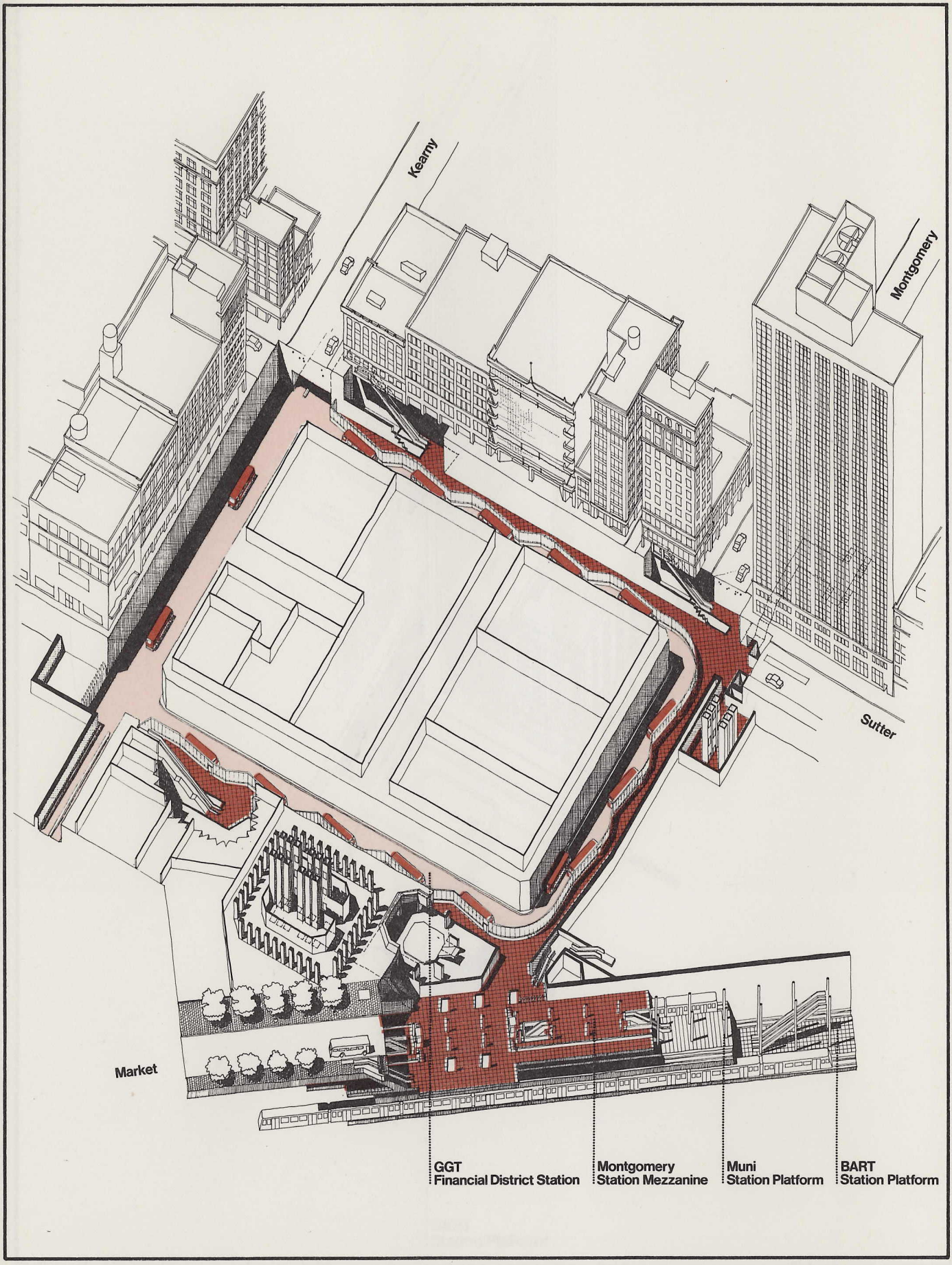
FIGURE V - 37A



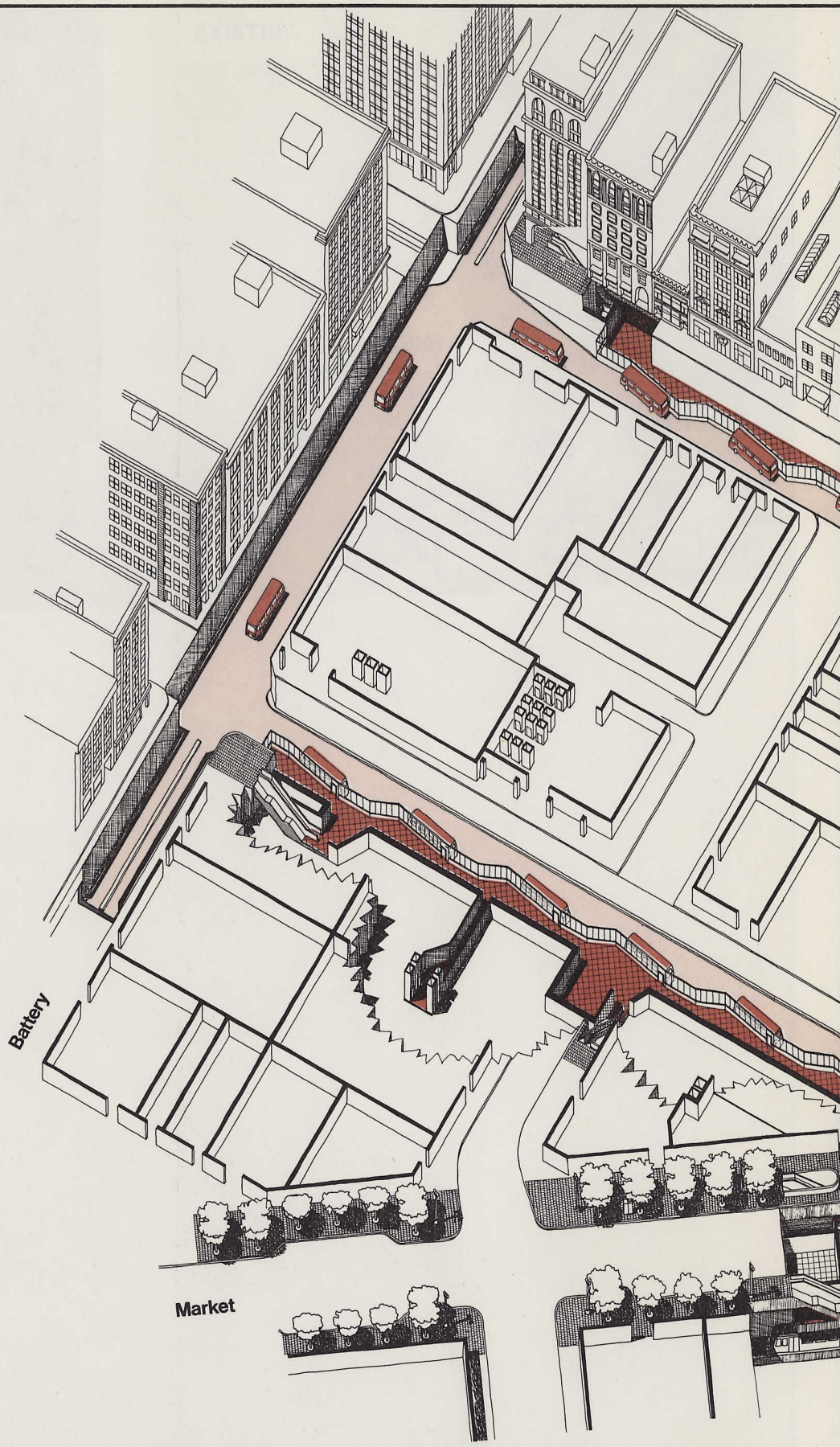
FINANCIAL DISTRICT STATION - KEARNY STREET

FIGURE V - 37B

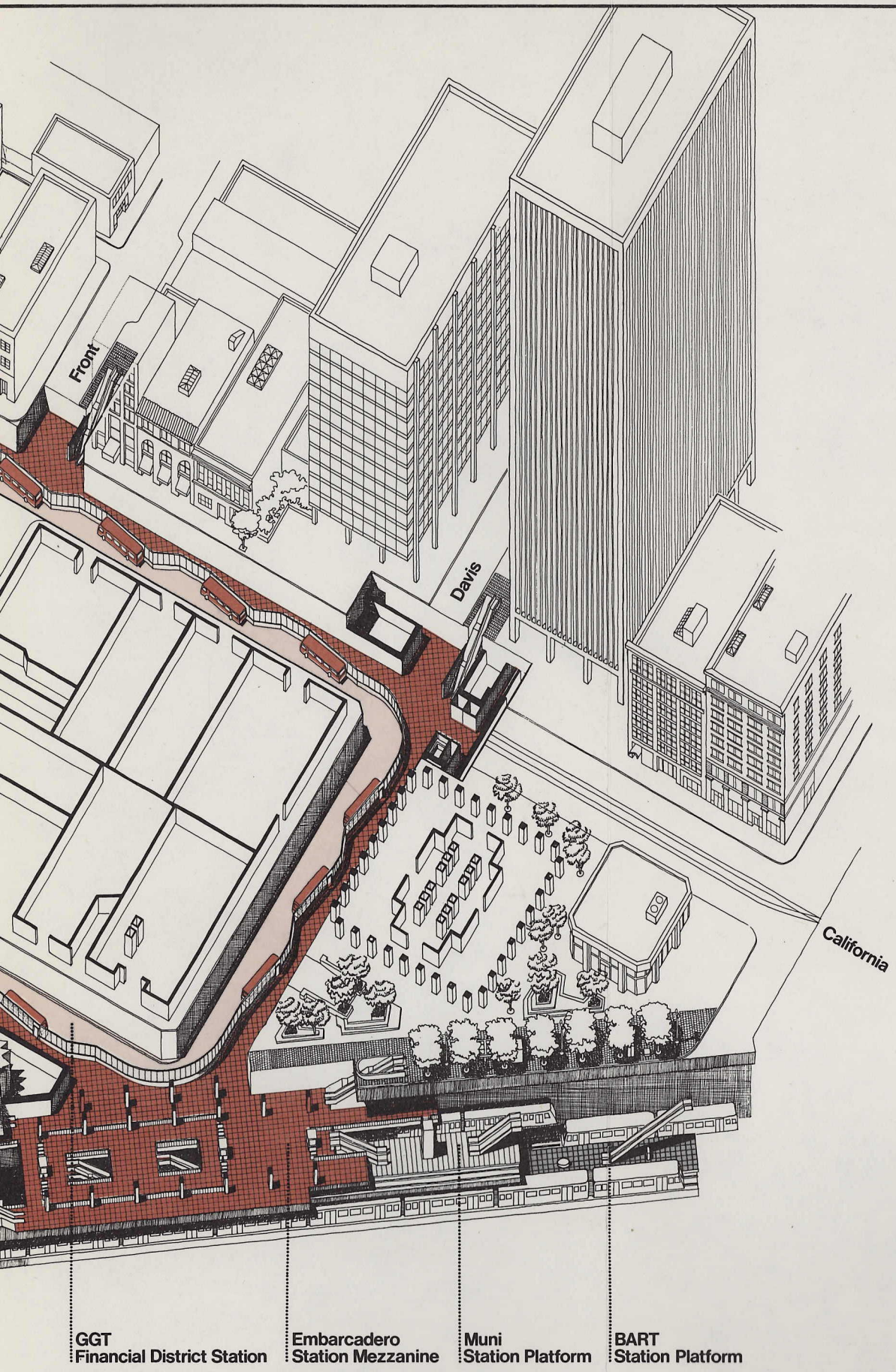
FINANCIAL DISTRICT STATION - KEARNY STREET



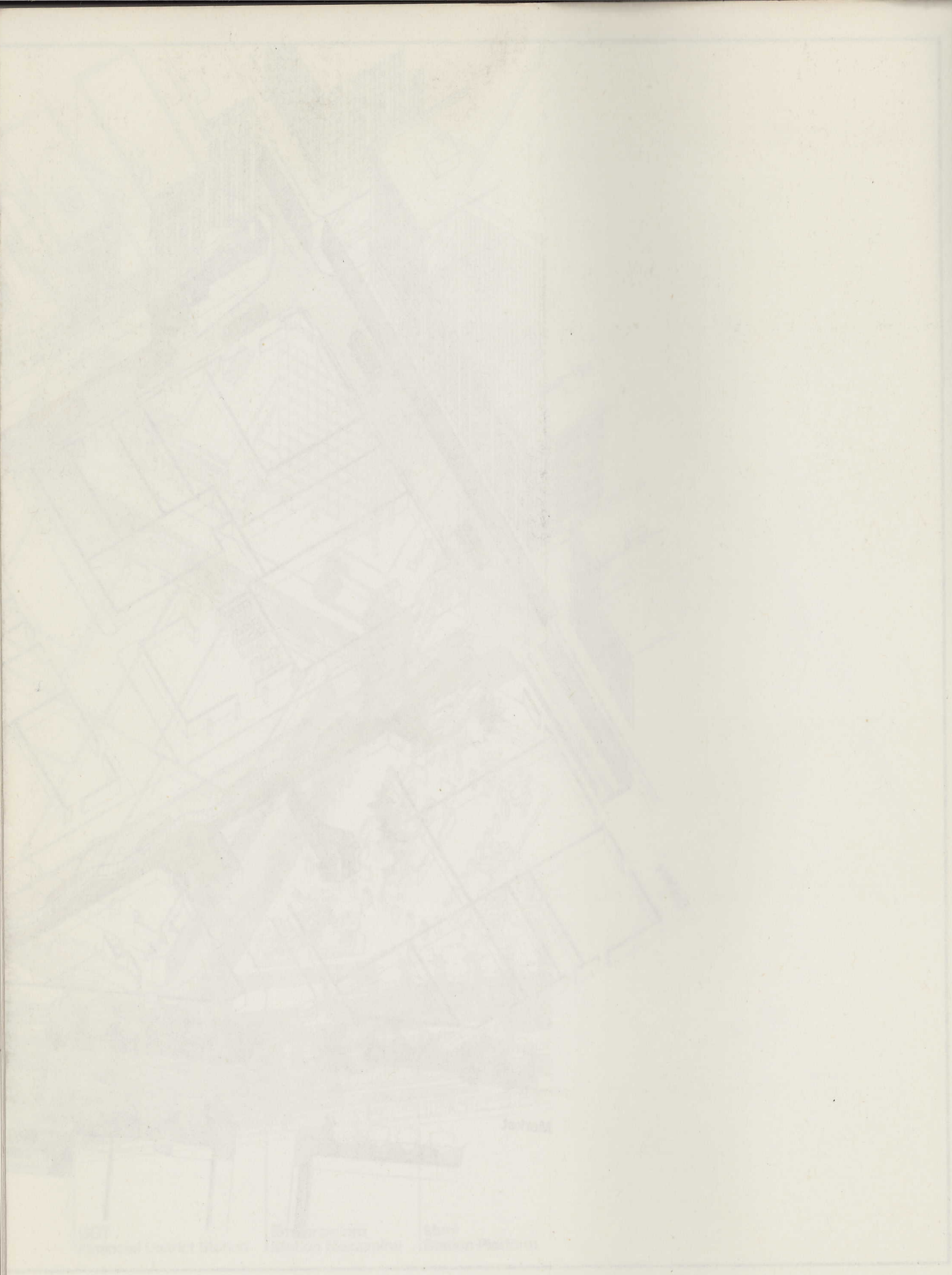
FINANCIAL DISTRICT STATION - KEARNY STREET

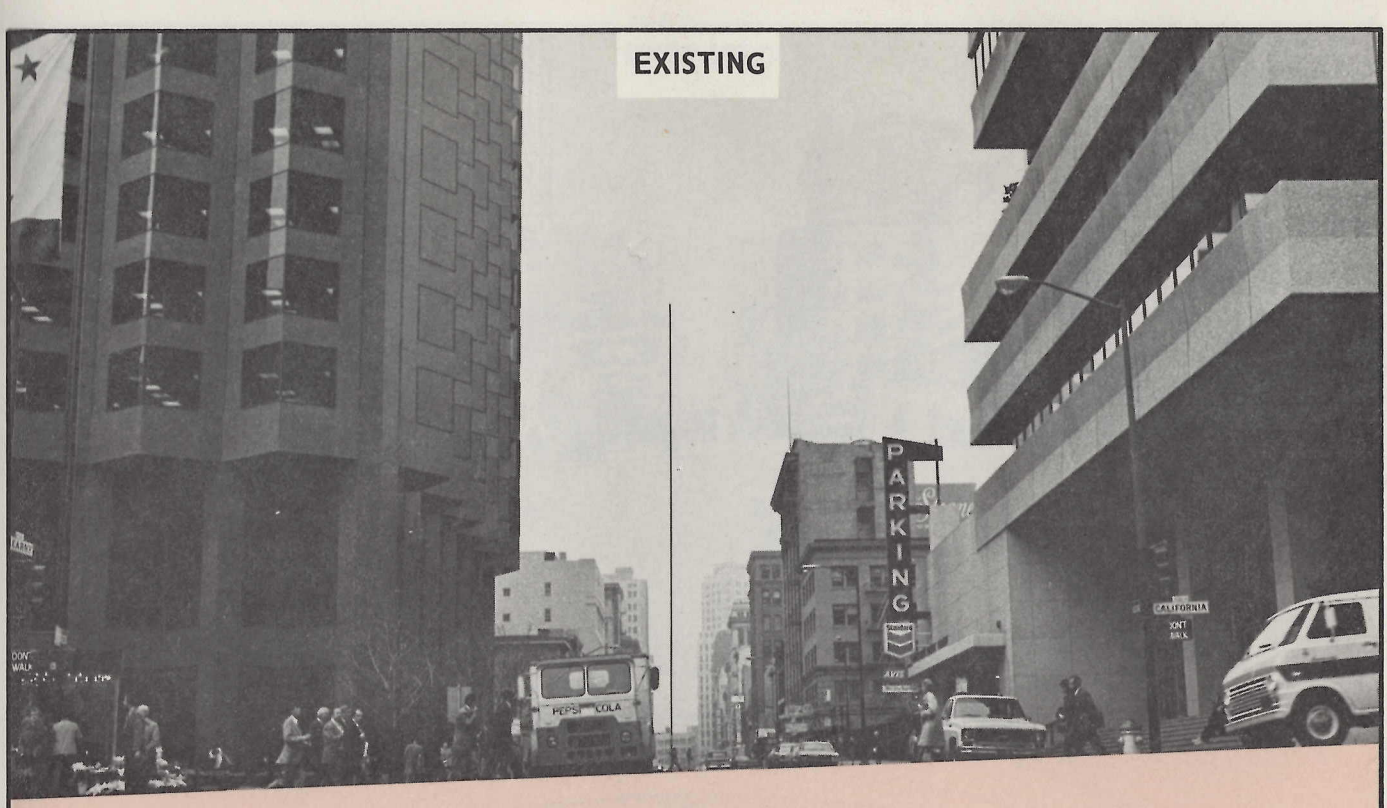


FINANCIAL DISTRICT



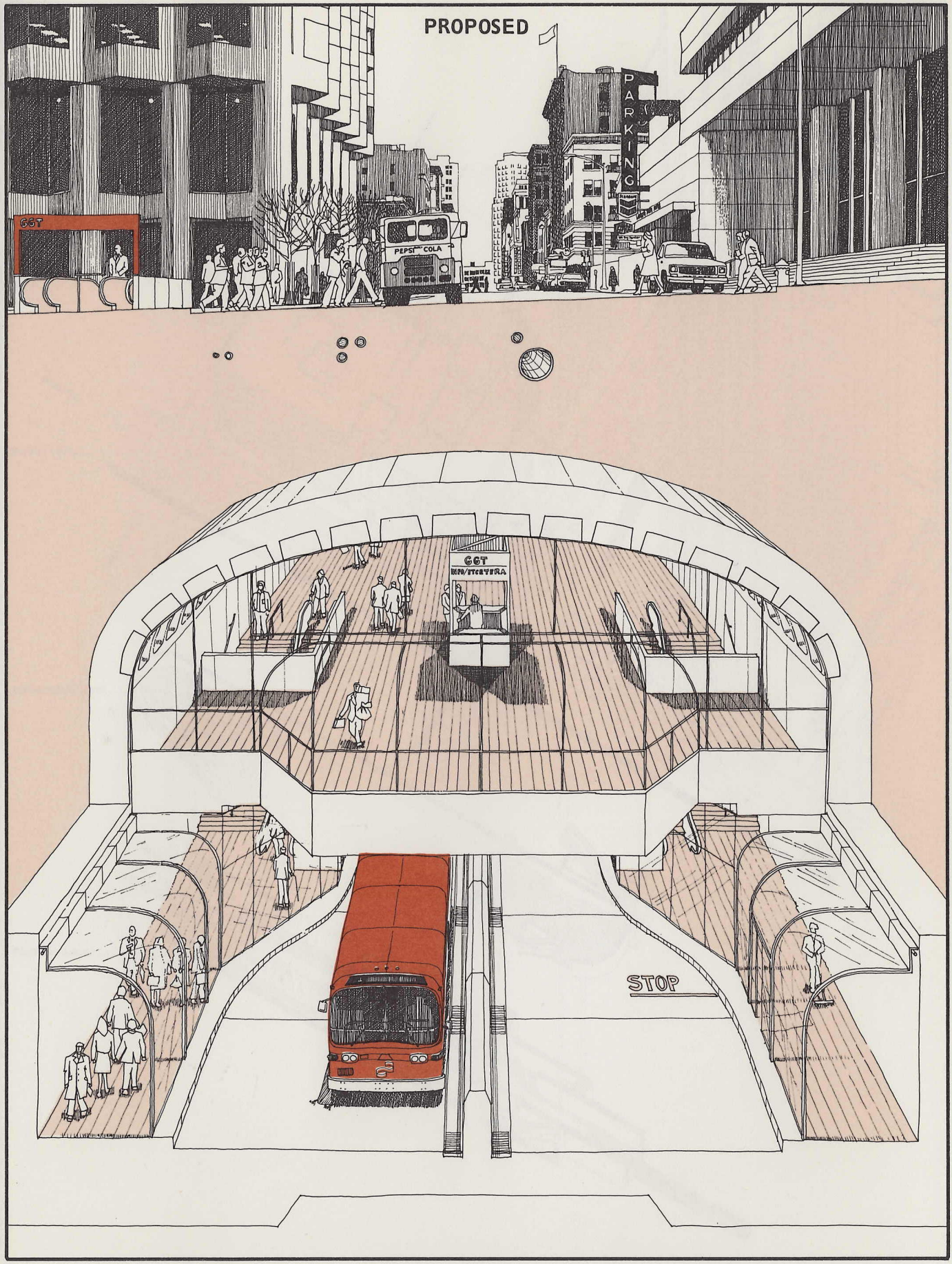
STATION - BATTERY STREET





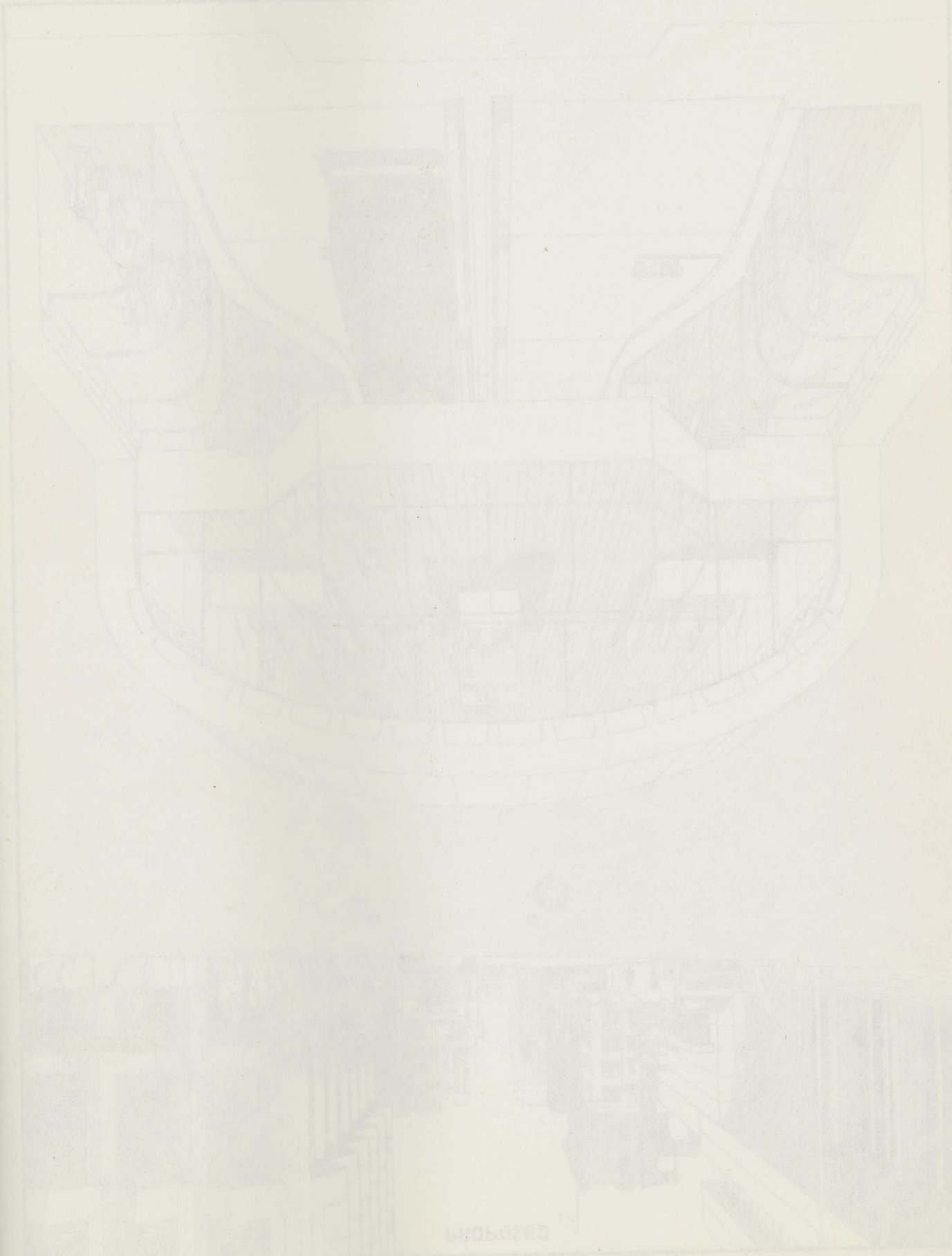
KEARNY AND CALIFORNIA STREETS

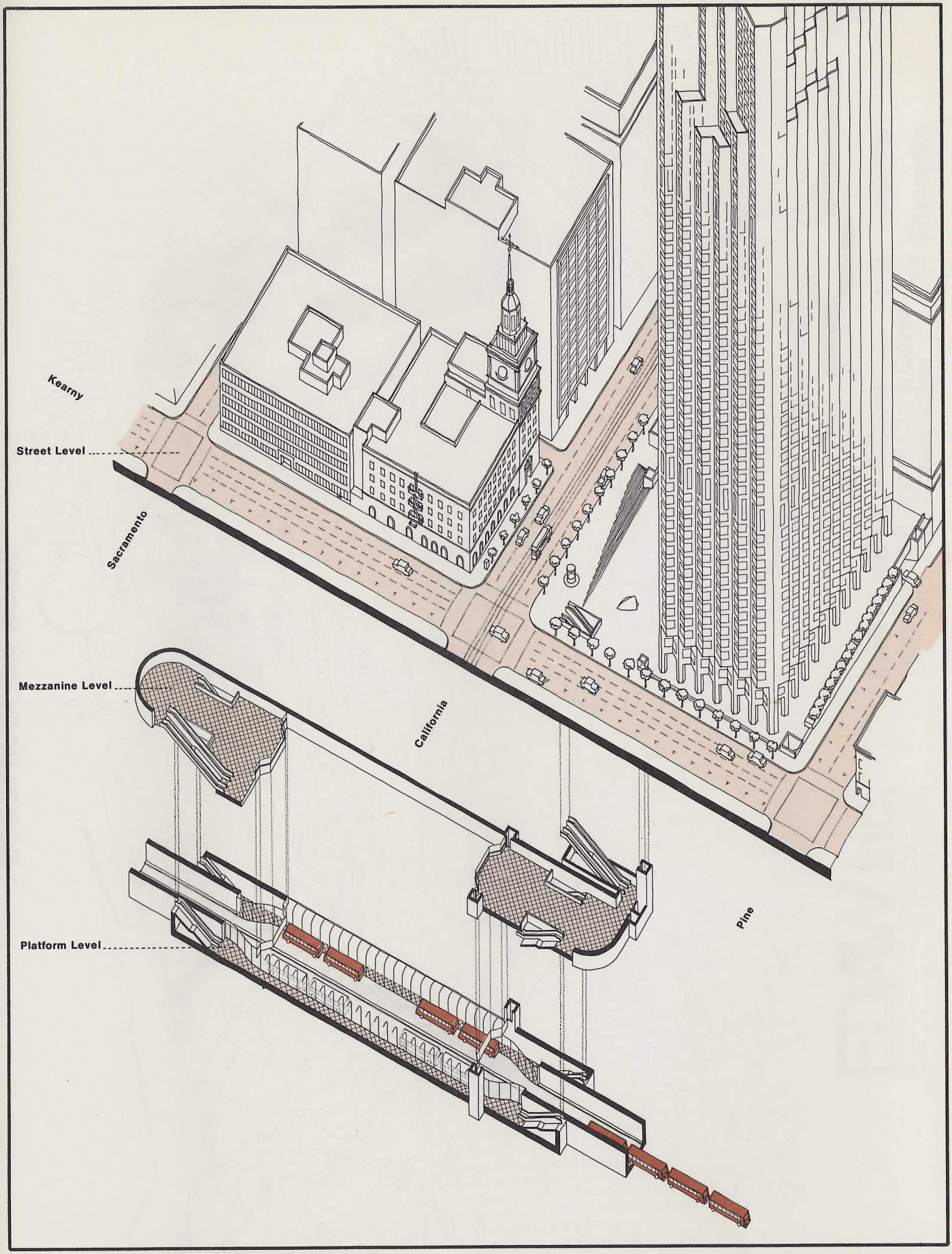
FIGURE V - 40A



TYPICAL INTERMEDIATE STATION
AT KEARNY AND CALIFORNIA

FIGURE V - 40B

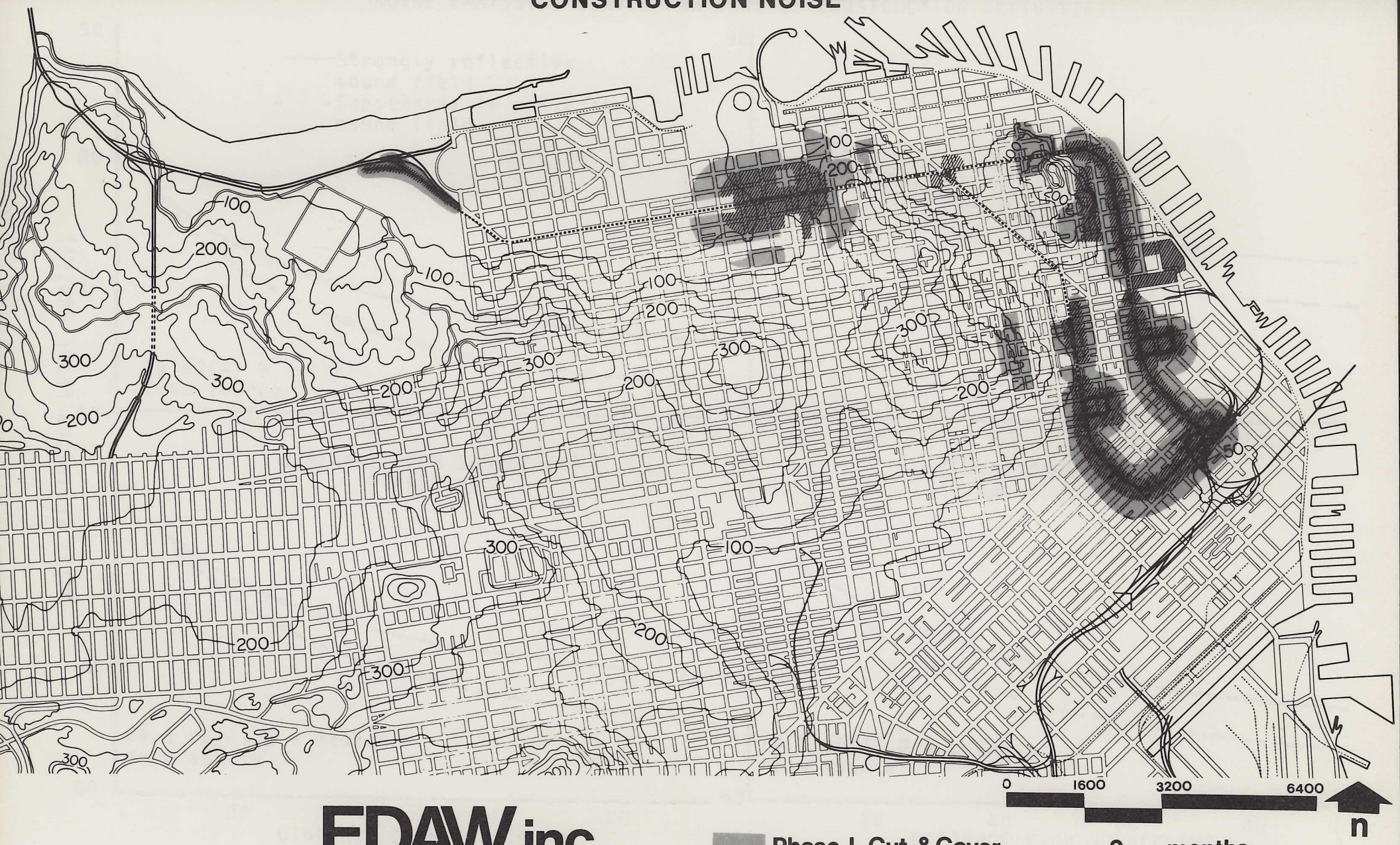




TYPICAL INTERMEDIATE STATION - CALIFORNIA STREET

FIGURE ~~V-43~~ E-42

CONSTRUCTION NOISE

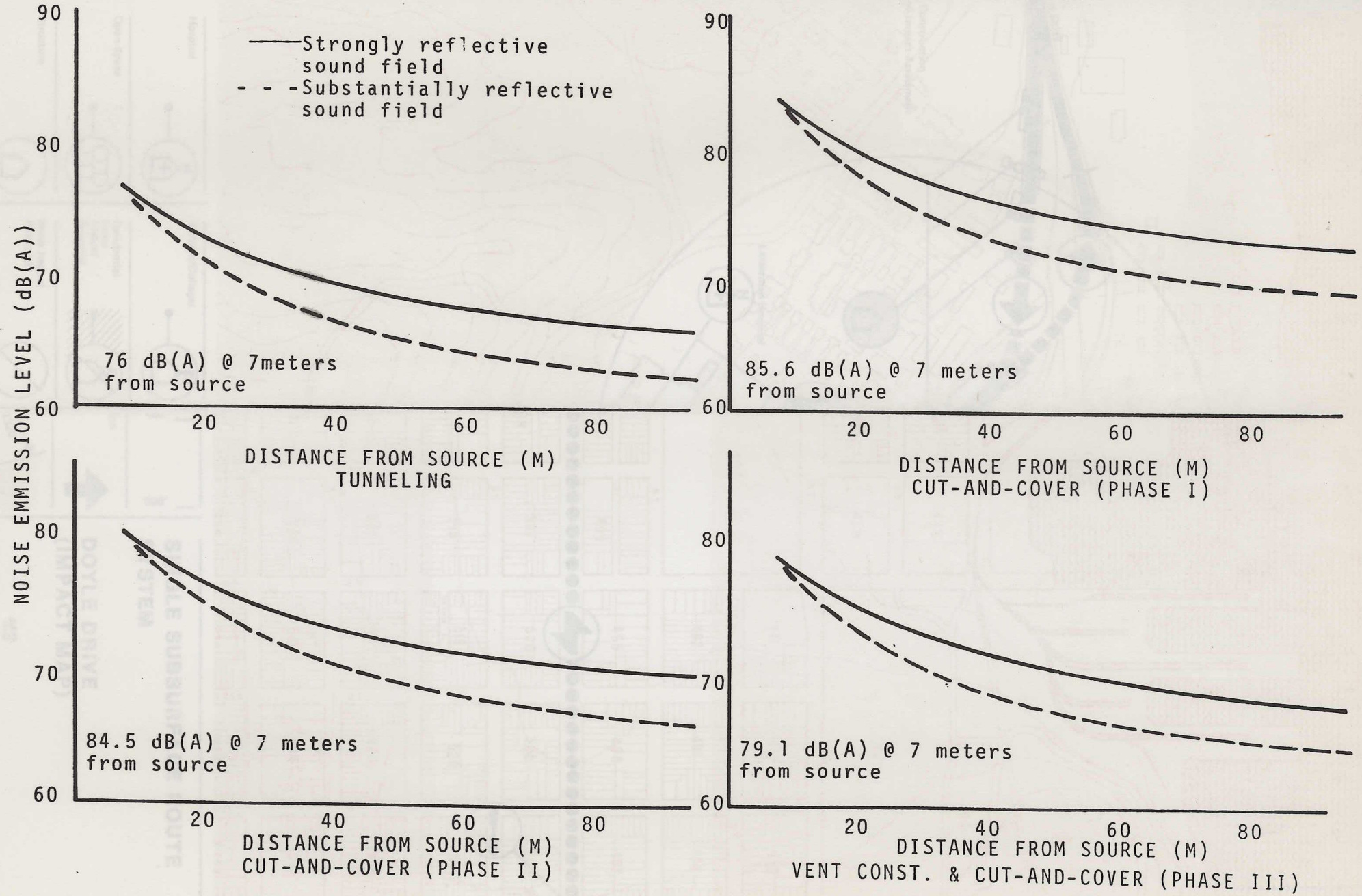


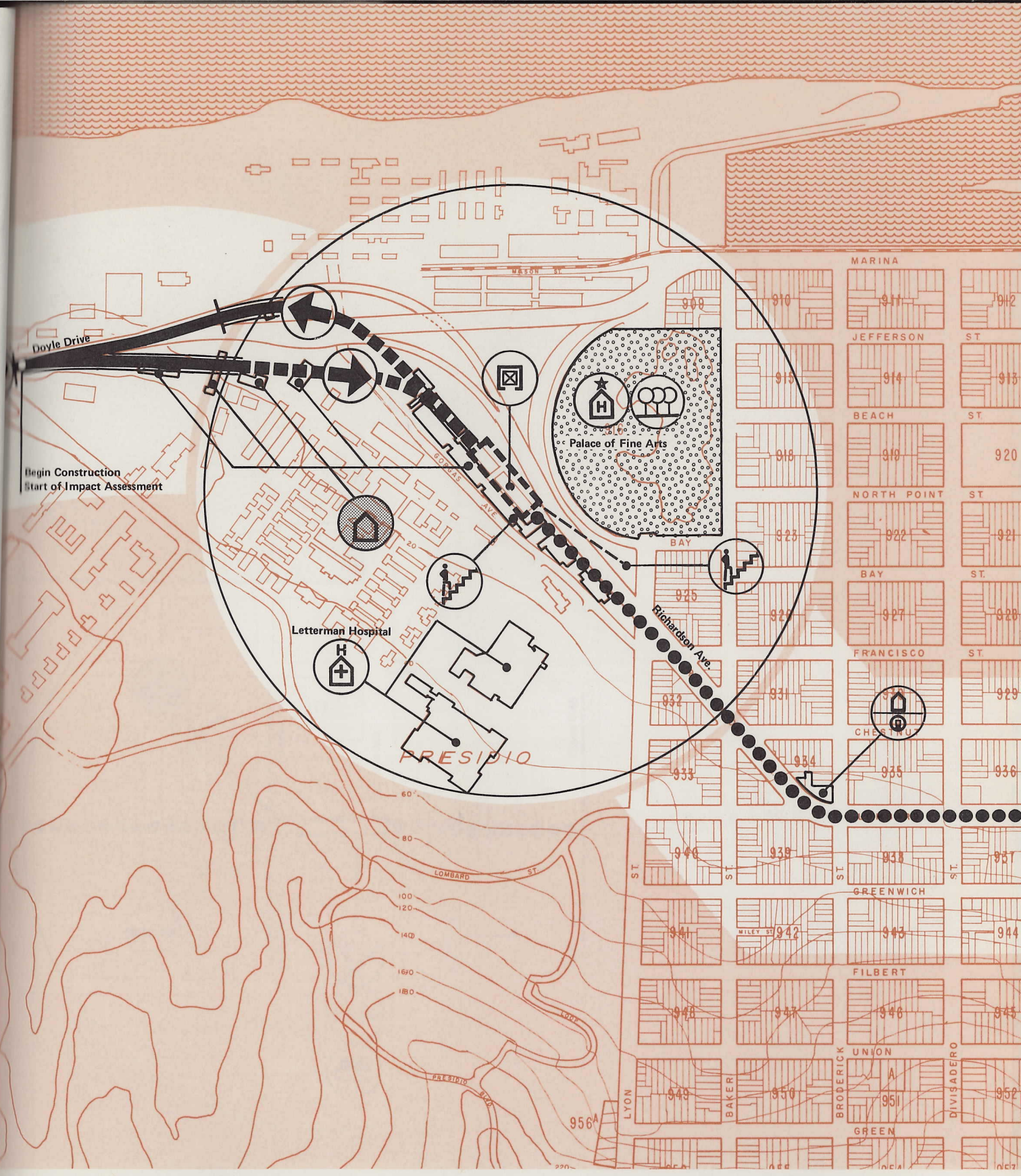
EDAW inc.
Environmental Planning Urban Design Landscape Architecture
San Francisco Newport Beach Honolulu Minneapolis
145 Mission Street San Francisco CA 94105 (415) 433-1484

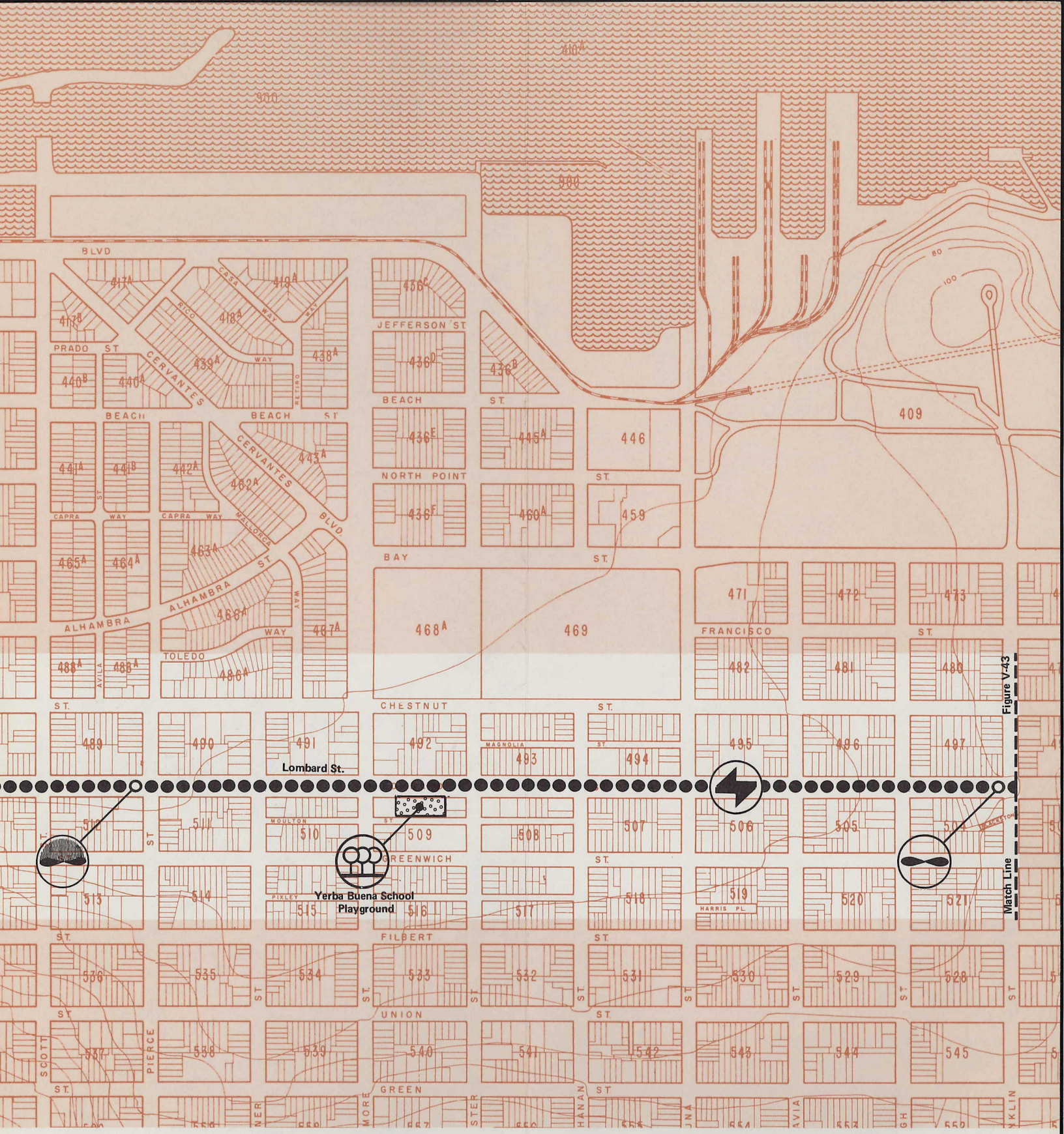
Phase I Cut & Cover : 2 months

Phase II and III Cut & Cover and Vent Construction : 18-36 months

NOISE EMMISSION CURVES FOR VARIOUS CONSTRUCTION ACTIVITIES




Doyle Drive
Begin Construction
Start of Impact Assessment
Palace of Fine Arts
Letterman Hospital
Richardson Ave.
PRESIDIO
MARINA
JEFFERSON ST
BEACH ST
NORTH POINT ST
BAY ST
FRANCISCO ST
CHESTNUT
GREENWICH
FILBERT
UNION
GREEN
LOMBARD ST
MASON ST
GORGAS AVE
MILEY ST
LYON
BAKER
BRODERICK
DIVISADERO
Hospital
Schools/Colleges
Historic Landmark
Parking
Elevator
Open Space
Residential Noise Impact Potential
Landmark
Demand Stop
Underground R.O.W. Easement
Structure
Noise Impact Potential
Displaced Activity
Business/ Employment
Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

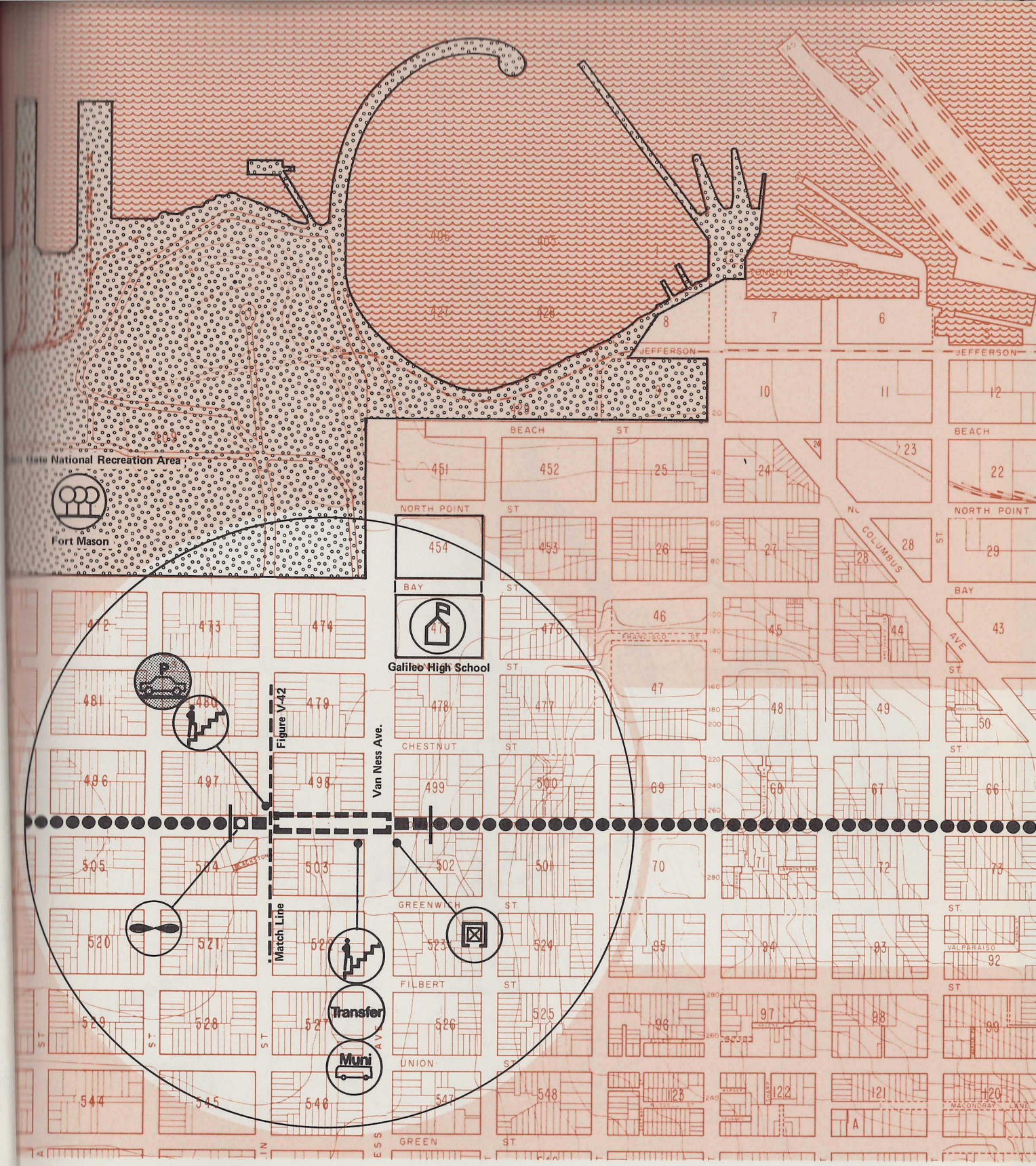
5 Min. Walk To Station

R = 1320'

SINGLE SUBSURFACE ROUTE SYSTEM

DOYLE DRIVE (IMPACT MAP)

FIGURE V - 43



Hospital

Open Space

Structure

Schools/Colleges

Residential Noise Impact Potential

Noise Impact Potential

Historic Landmark

Landmark

Displaced Activity

Parking

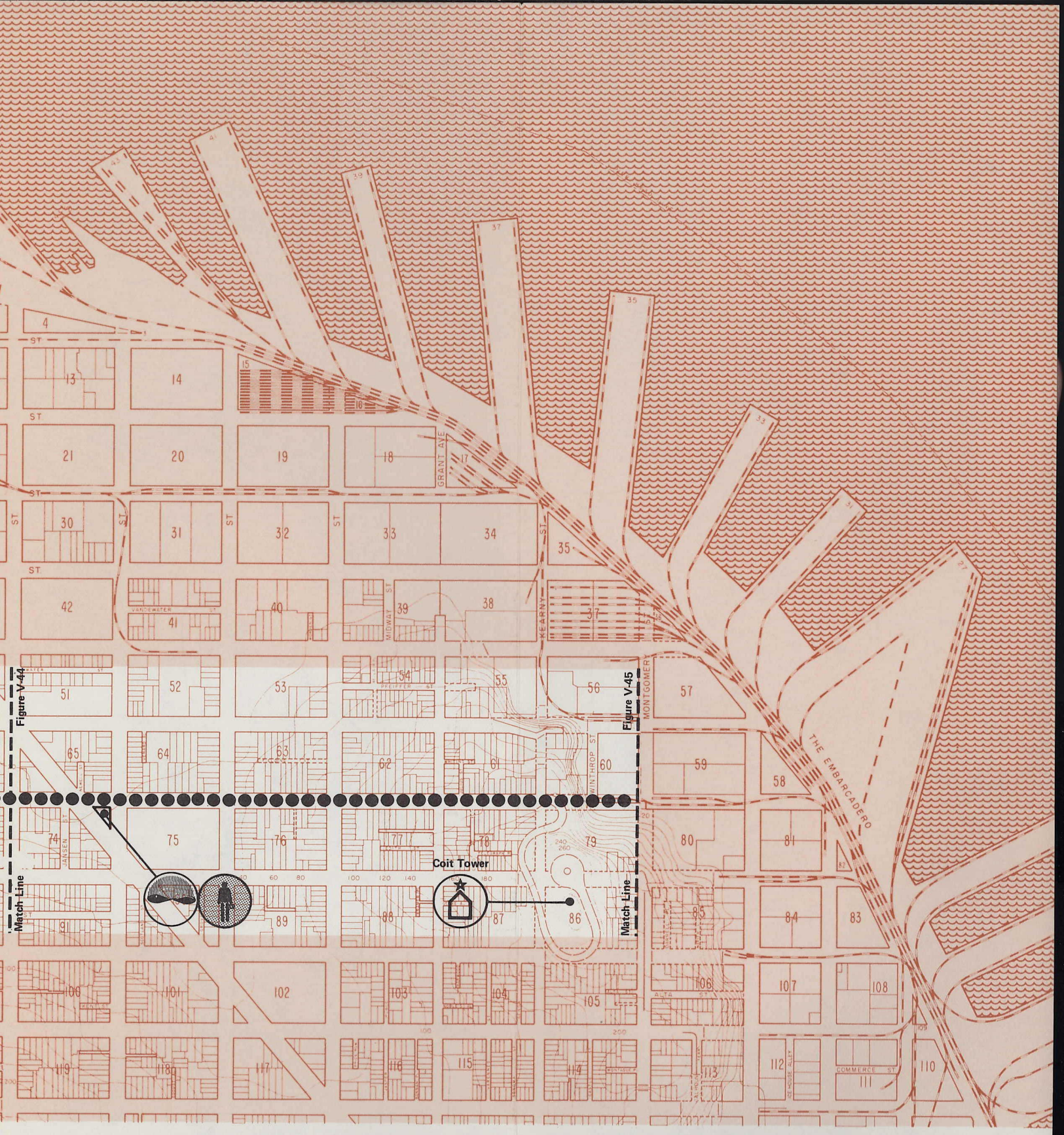
Demand Stop

Business/ Employment

Elevator

Underground R.O.W. Easement

Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

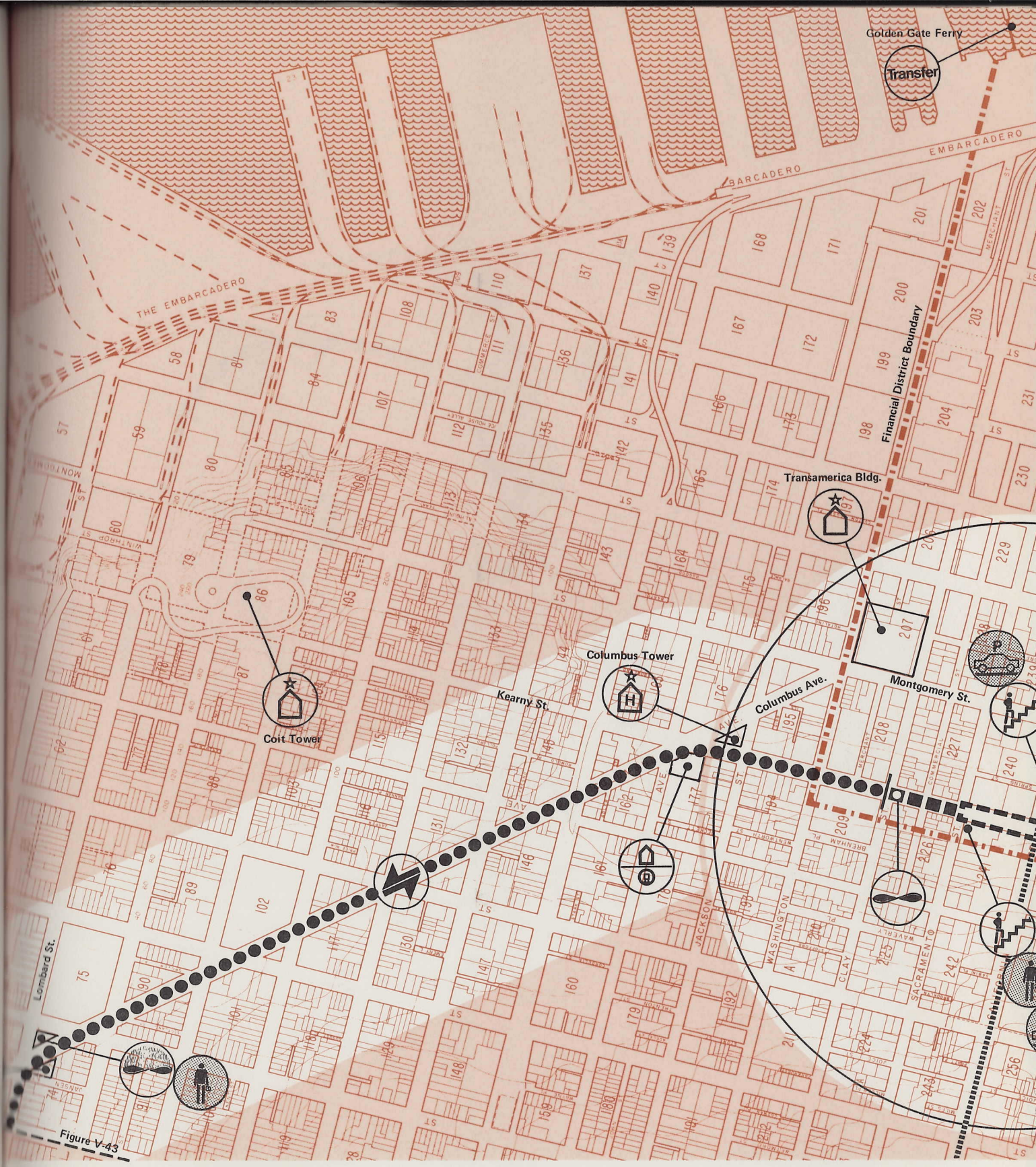
5 Min. Walk To Station

R = 1320'

SINGLE SUBSURFACE ROUTE SYSTEM

LOMBARD STREET (IMPACT MAP)

FIGURE V - 44



Hospital	Schools/Colleges	Historic Landmark	Parking	Elevator
Open Space	Residential Noise Impact Potential	Landmark	Demand Stop	Underground R.O.W. Easement
Structure	Noise Impact Potential	Displaced Activity	Business/ Employment	Access to Station

Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

5 Min. Walk To Station

R = 1320'

SINGLE SUBSURFACE ROUTE SYSTEM

COLUMBUS-KEARNY (IMPACT MAP)

FIGURE V - 45A ~~44A~~

Hospital

Schools/Colleges

Historic Landmark

Parking

Elevator

Open Space

Residential Noise Impact Potential

Landmark

Demand Stop

Underground R.O.W. Easement

Structure

Noise Impact Potential

Displaced Activity

Business/ Employment

Access to Station

Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

5 Min. Walk To Station

R = 1320'

SINGLE SUBSURFACE ROUTE SYSTEM

BATTERY STREET (IMPACT MAP)

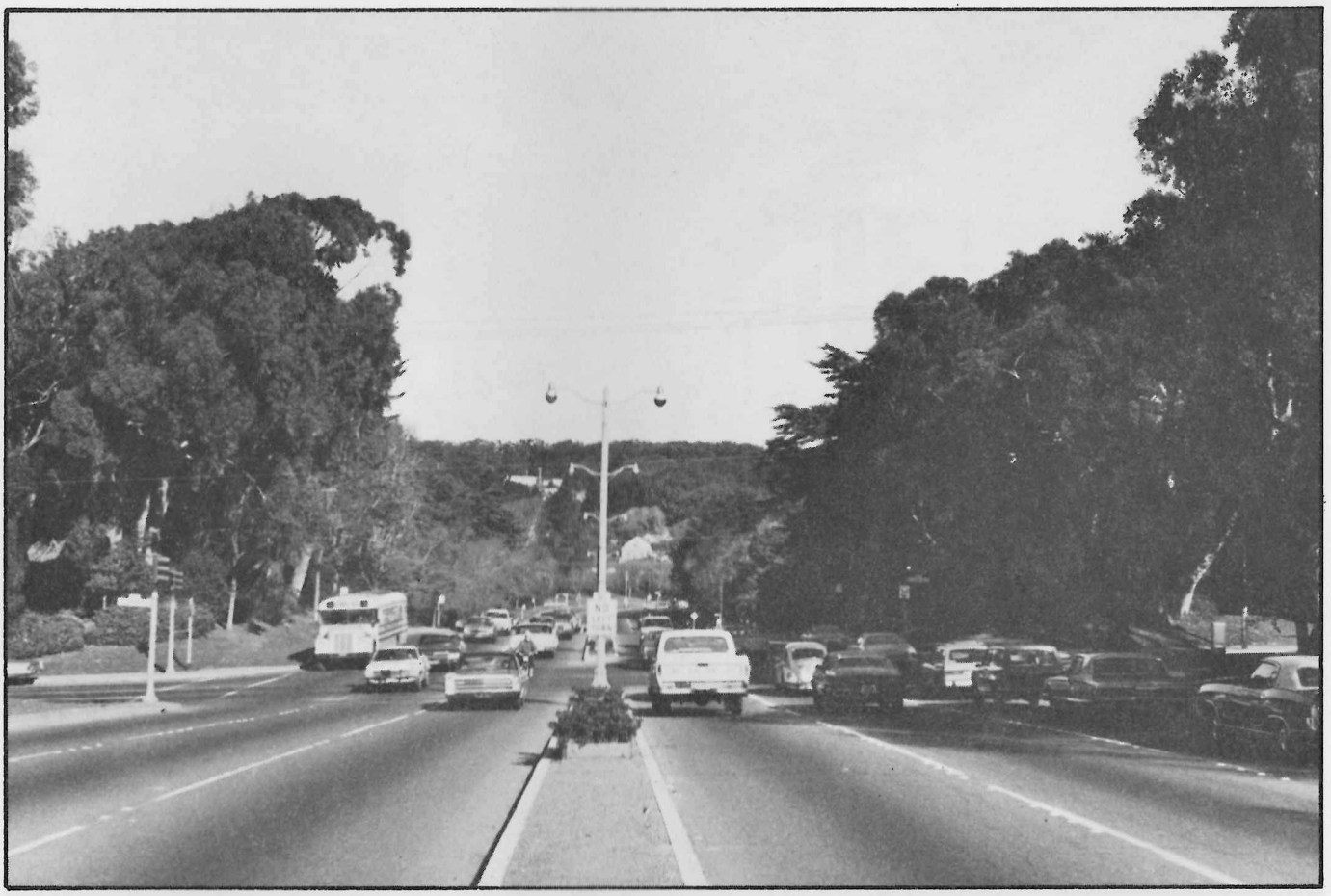
FIGURE V - ~~44B~~ 45B

GOLDEN GATE
SAN FRANCISCO BAY
PACIFIC OCEAN
110
22
30
38
51
45
California St
Geary Blvd
Park Presidio Blvd
GOLDEN GATE PARK
PANHANDLE
800

FIGURE V-46

DISPERSED SURFACE ROUTE SYSTEM

KAISER ENGINEERS



PARK PRESIDIO BOULEVARD AT CLEMENT STREET

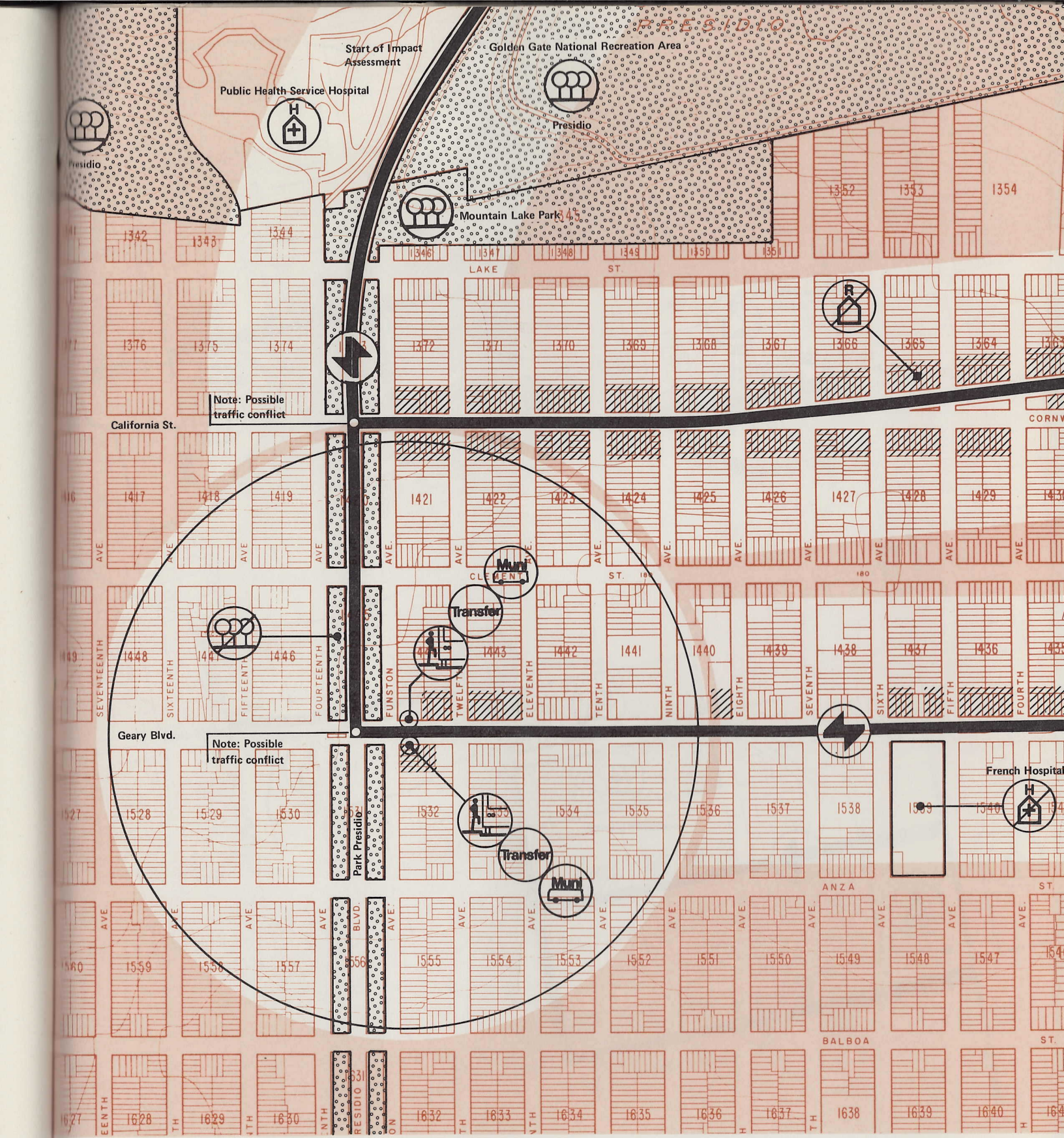
CALIFORNIA STREET AT 10th AVENUE

PARK PRESIDIO BOULEVARD AT CLEMENT STREET

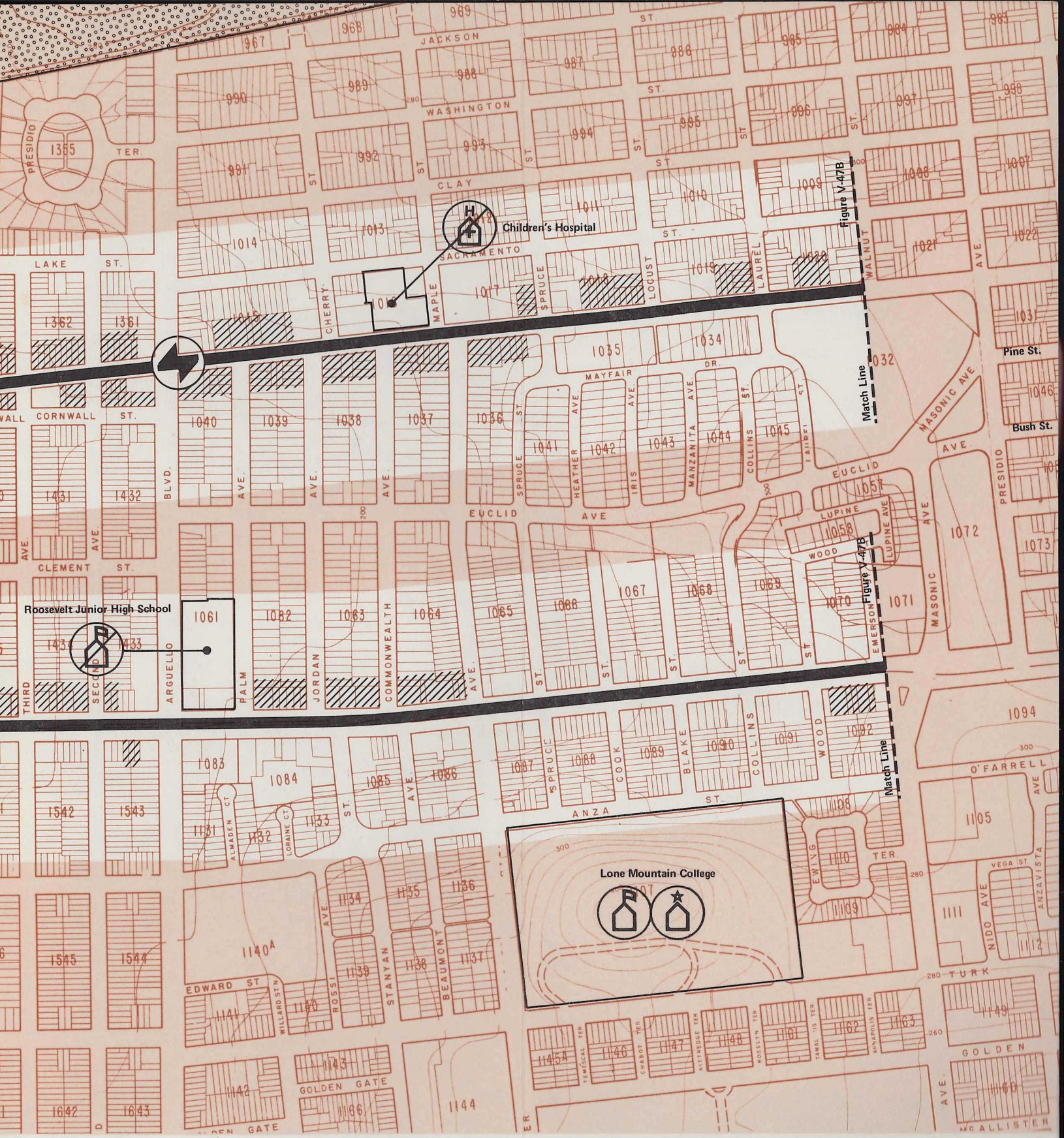
CALIFORNIA STREET AT 19th AVENUE

LAGUNA STREET AT SUTTER STREET

BROADWAY STREET AT POWELL STREET



Hospital	Schools/Colleges	Historic Landmark	Parking	Elevator
Open Space	Residential Noise Impact Potential	Landmark	Demand Stop	Underground R.O.W. Easement
Structure	Noise Impact Potential	Displaced Activity	Business/ Employment	Access to Station



Exhaust Vent

Intake Vent

Subsurface Station

Surface Station

Mixed Traffic Surface Route

Aerial Transition

Tunnel

Cut/Cover

Reversible Lane

Contra Flow Lane

Reserved Lane

200' 400' 800'

North Orientation

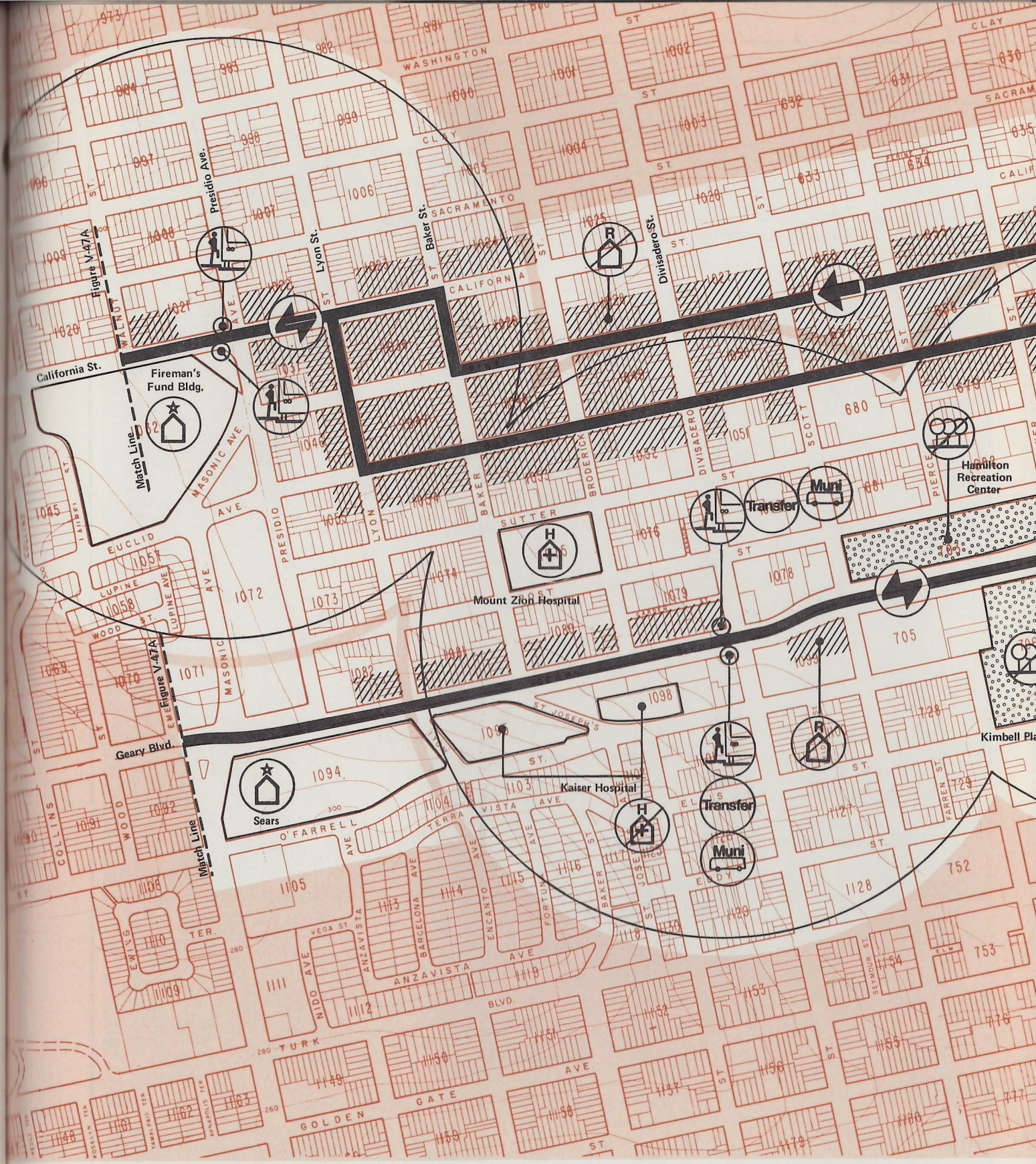
5 Min. Walk To Station

R = 1320'

DISPERSED SURFACE ROUTE SYSTEM

(IMPACT MAP)

FIGURE V - 47A

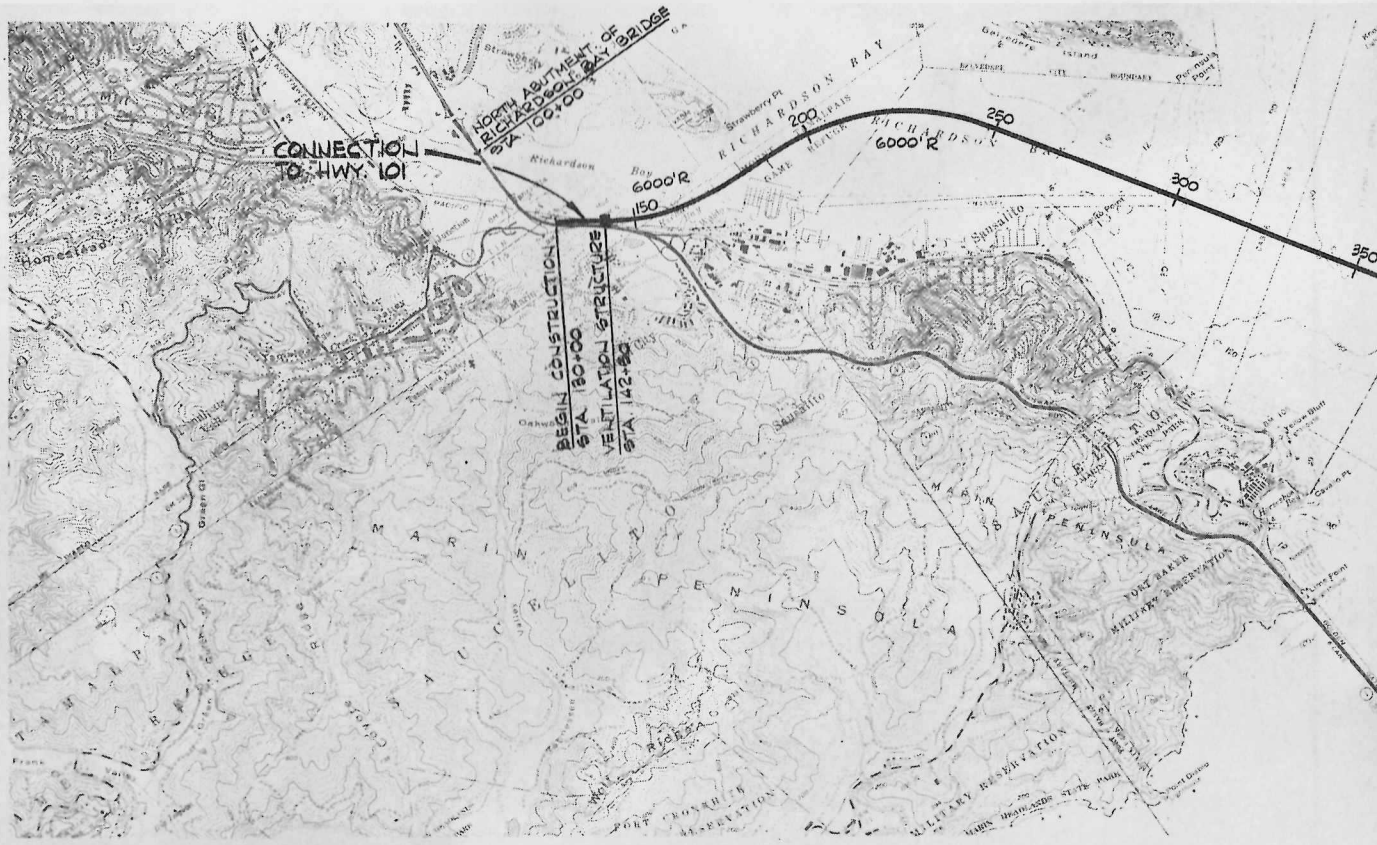


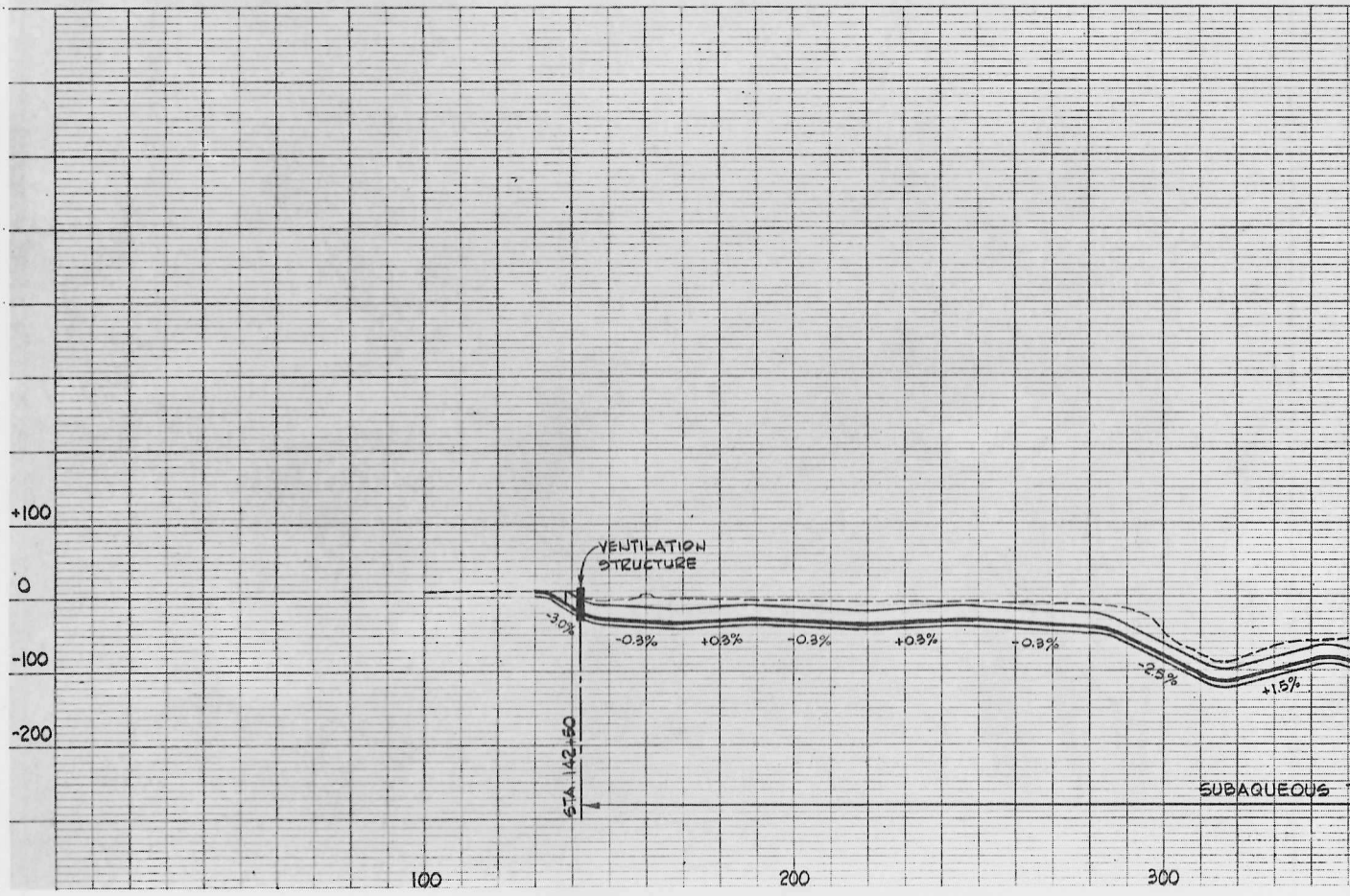
Hospital	Schools/Colleges	Historic Landmark	Parking	Elevator
Open Space	Residential Noise Impact Potential	Landmark	Demand Stop	Underground R.O.W. Easement
Structure	Noise Impact Potential	Displaced Activity	Business/ Employment	Access to Station

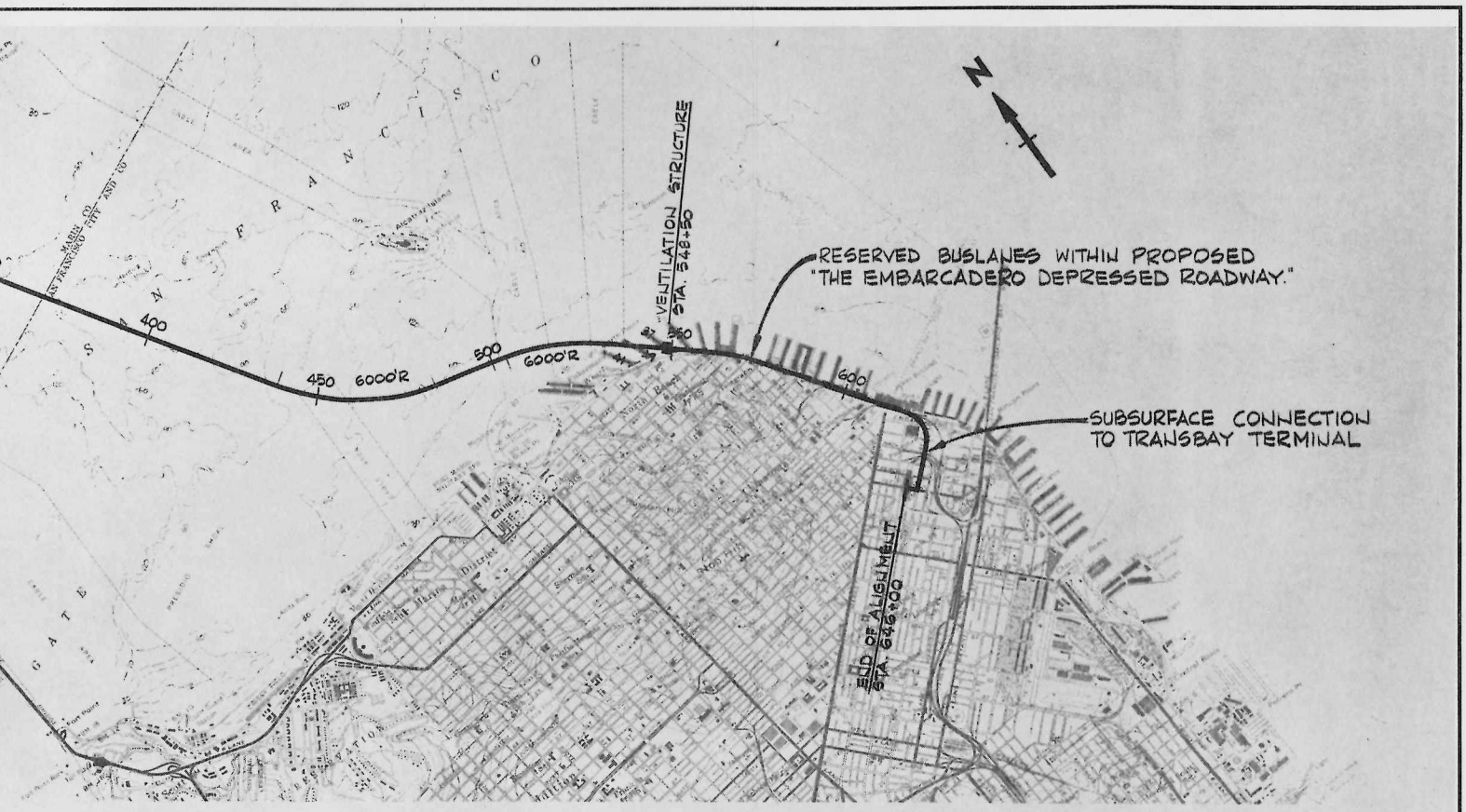
DISPERSED SURFACE ROUTE SYSTEM

(IMPACT MAP)

FIGURE V - 47B


CONNECTION TO HWY. 101
NORTH ABUTMENT OF RICHARDSON BAY BRIDGE STA. 100+00
BEGIN CONSTRUCTION STA. 130+00
VENTILATION STRUCTURE STA. 142+50
RICHARDSON BAY
6000'R
150
200
250
300
350
Sausalito
Homestead
MARIN PENINSULA
SAUSALITO
FORT BAKER MILITARY RESERVATION
FORT CROCKETT MILITARY RESERVATION
MARIN HEADLANDS STATE PARK


+100
0
-100
-200
VENTILATION STRUCTURE
-3.0%
-0.3%
+0.3%
-0.3%
+0.3%
-0.3%
-2.5%
+1.5%
STA. 142+50
SUBAQUEOUS
100
200
300



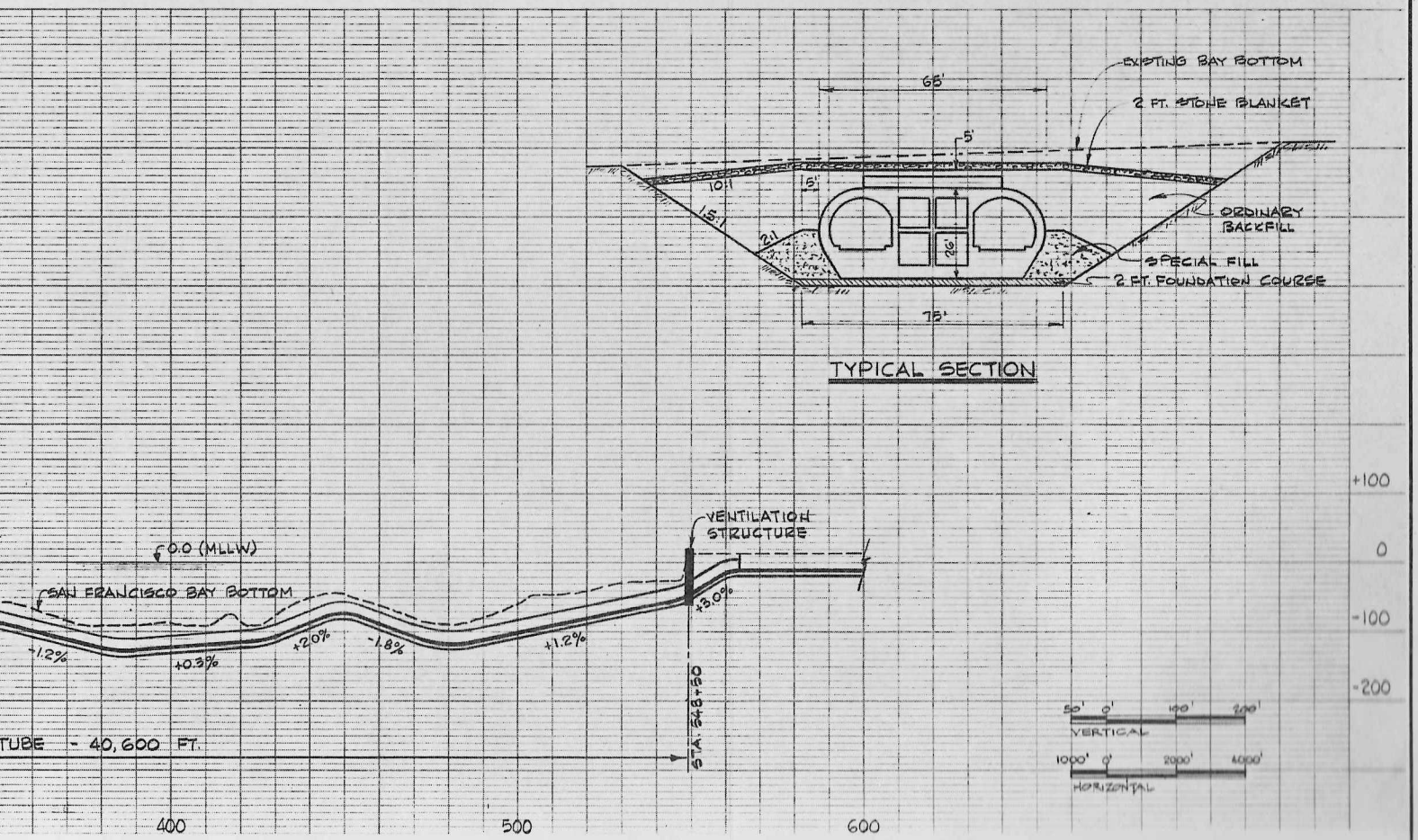


FIGURE V-48

SUBAQUEOUS TUBE

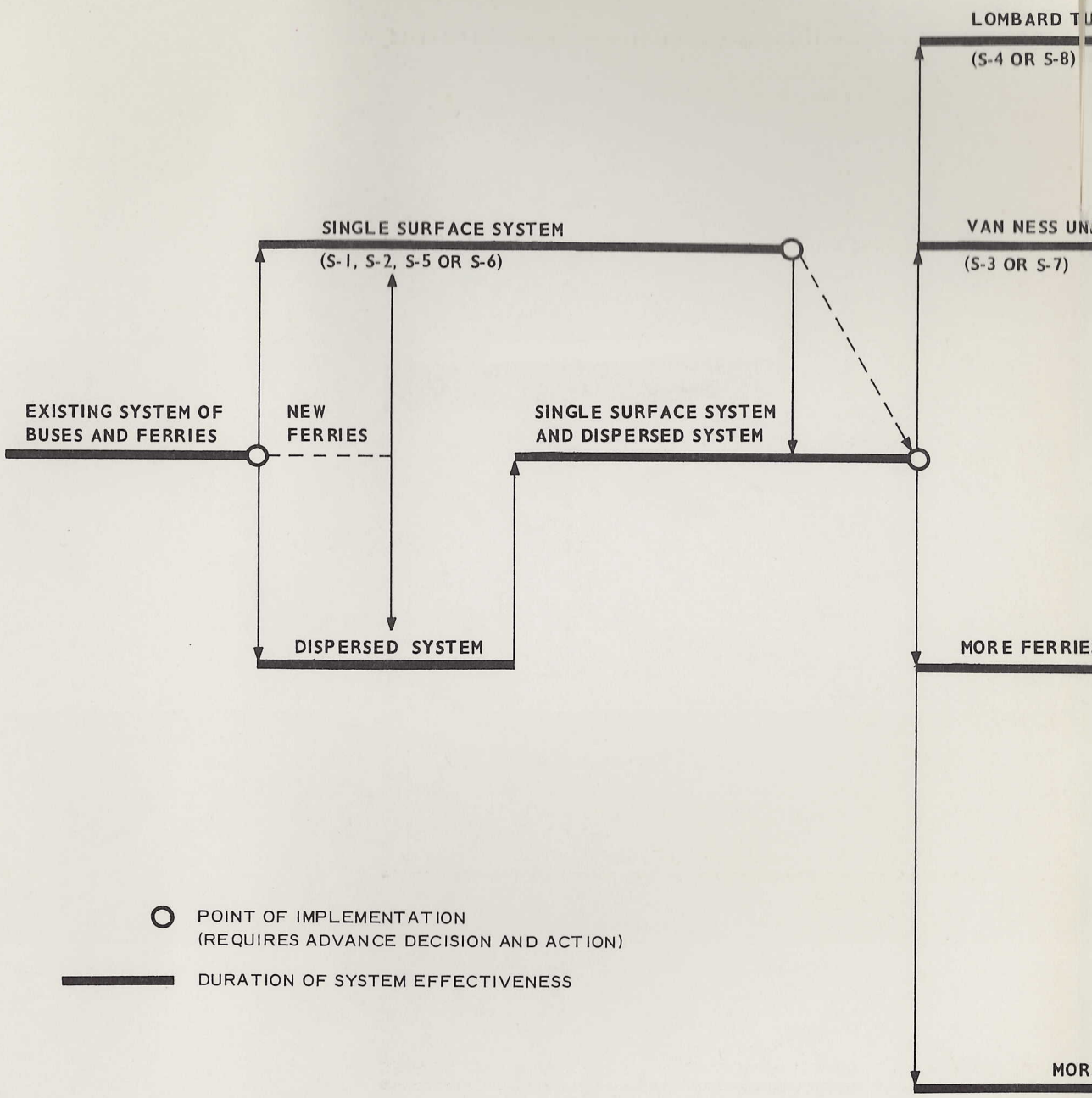
KAISER ENGINEERS

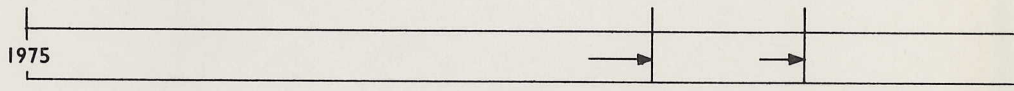
GOLDEN GATE
SAN FRANCISCO BAY
PACIFIC OCEAN
BUS TRANSFER STATION
PROPOSED NORTHWEST CORRIDOR TRANSIT EXTENSION
GOLDEN GATE PARK
PANHANDLE
GOLDEN GATE PARK
800

FIGURE V-49

JOINT USE CORRIDOR TRANSFER ALTERNATIVE

KAISER ENGINEERS


LOMBARD T
(S-4 OR S-8)
SINGLE SURFACE SYSTEM
(S-1, S-2, S-5 OR S-6)
VAN NESS UN
(S-3 OR S-7)
EXISTING SYSTEM OF BUSES AND FERRIES
NEW FERRIES
SINGLE SURFACE SYSTEM AND DISPERSED SYSTEM
DISPERSED SYSTEM
MORE FERRIE
POINT OF IMPLEMENTATION
(REQUIRES ADVANCE DECISION AND ACTION)
DURATION OF SYSTEM EFFECTIVENESS
MOR


1975

TION - GOLDEN GATE TRANSIT SYSTEM

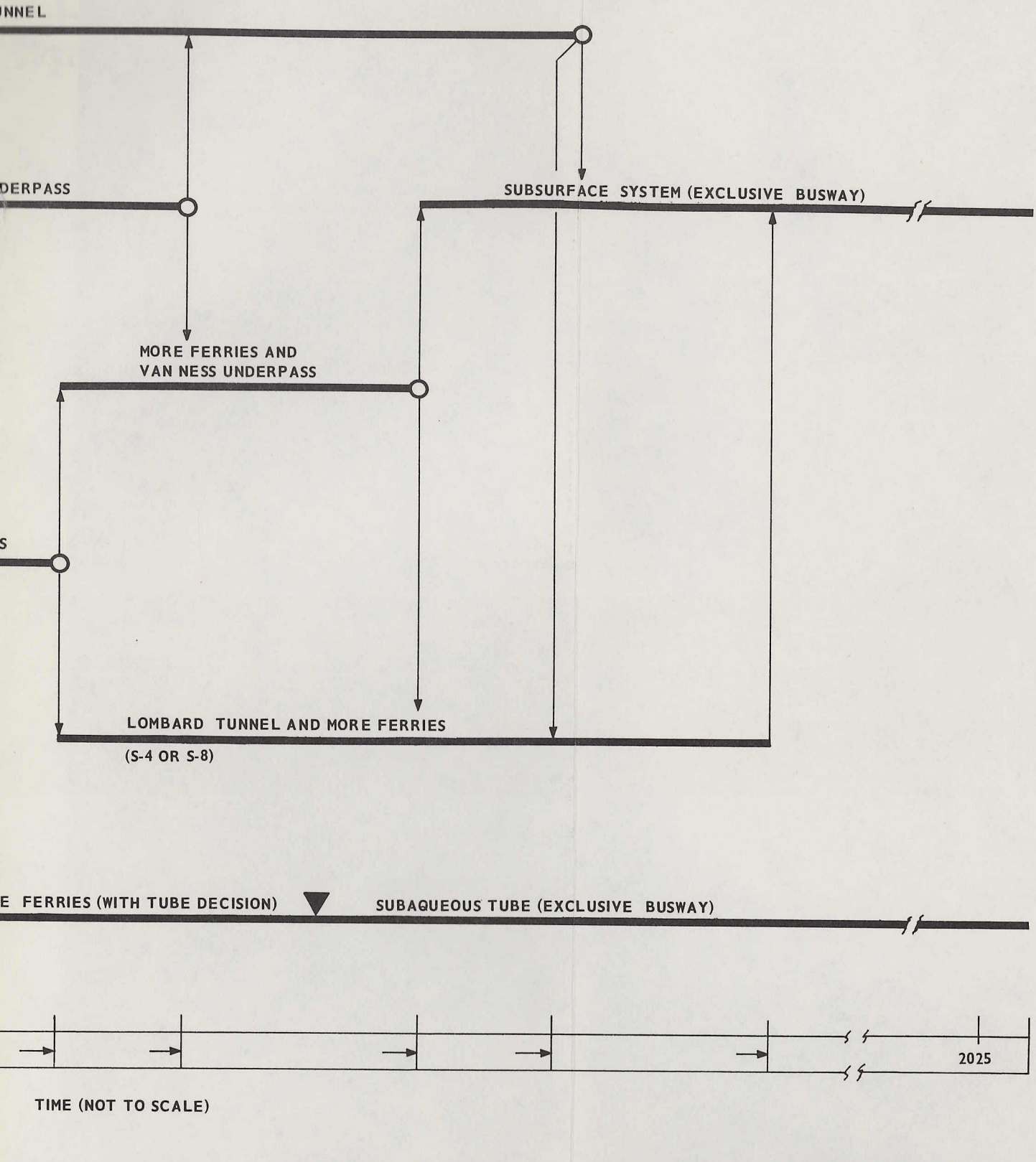


FIGURE VI - 1

DECISION DIAGRAM

KAISER ENGINEERS

RETURN TO: ENVIRONMENTAL DESIGN LIBRARY
210 Wurster Hall 642-4818

LOAN PERIOD 1	2	3
4	5	6

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS.
Please return books early if they are not being used.

UC BERKELEY
DUE AS STAMPED BELOW.

7 1 8 2007		
ENVI		

CHECK DUE DATE AT
oskicat.berkeley.edu/patron

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Berkeley, California 94720–6000

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